JAN 15 1936

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Removing Shale With Power Saws at Fort Peck

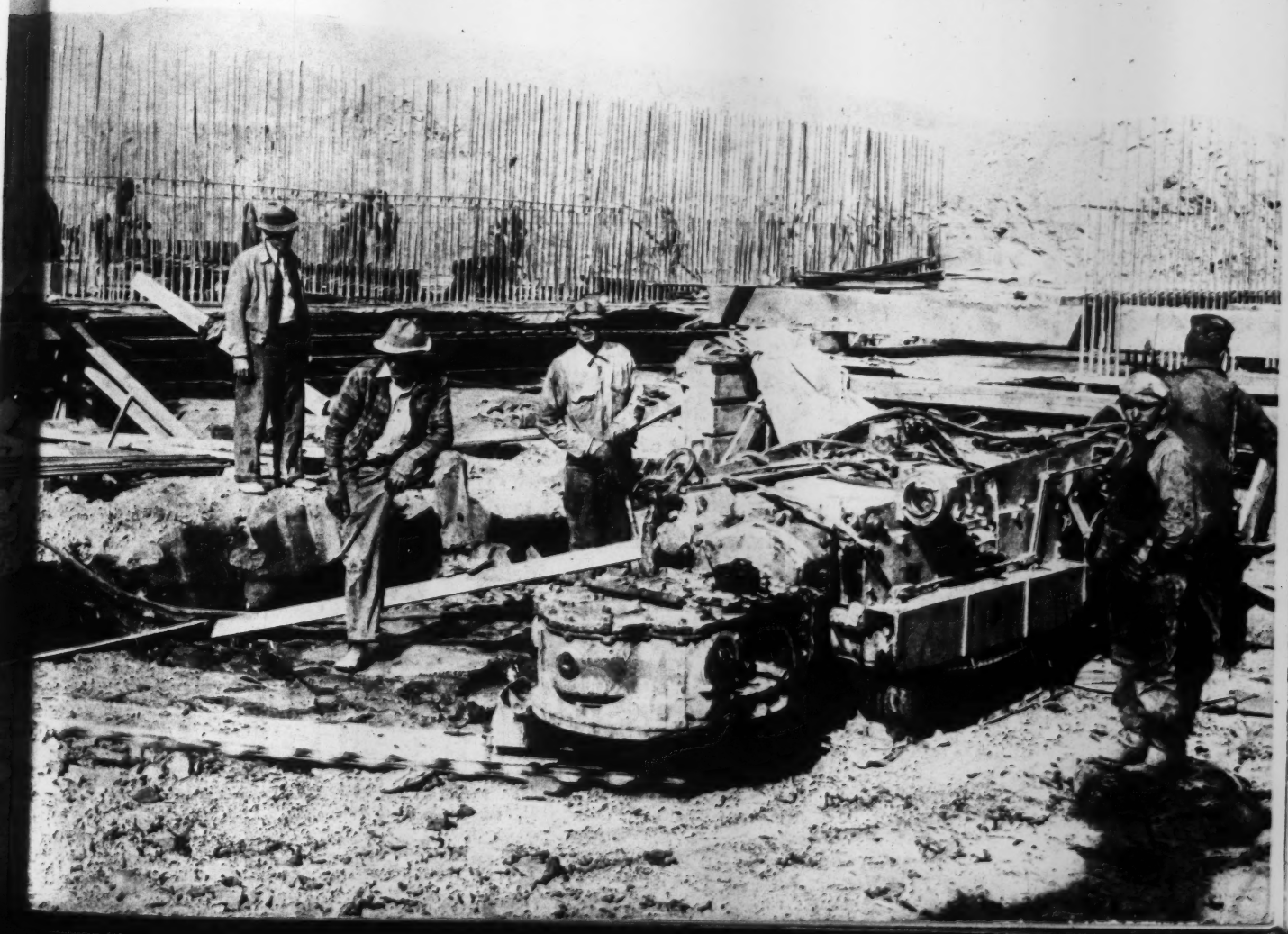
Detachable Railings for Rio Grande Bridge

Sealing Mines to End Acid Stream Pollution

A Review of Self-Anchored Suspension Bridges

Sewage Disposal Progress at Cleveland

POWER SAWS AT FORT PECK DAM slice shale overburden into ribbons and chunks for easy handling



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D I E S E L

Business Passes to the Offensive

ENTERING a new year, we must listen as usual to the chorus of those who hail with confidence or deplore with apprehension. This seems to be an indispensable part of the New Year ritual; to the degree that it fosters a mood of sane appraisal, it is a useful part.

But if we accept too literally all that we read and hear, its value will be dubious. It is well to remember that throughout the New Year symphony run certain strains of fact and substance and others of feeling and prejudice. The wise will try to distinguish between them, to discount the latter and to seek in the former inspiration for their own thinking.

Particularly will they write off the political ballyhoo. The partisan "pointers with pride" and "viewers with alarm" are a feature of every presidential campaign; this time they happen to have an unusually attentive and susceptible audience. But the judicious will try to salvage the facts and forget the frenzy; they will not let high-pressure appeals for their votes blind them to the realities of the business outlook.

Neither will they be too heavily influenced in their appraisal of business prospects by those who for perfectly good reasons of their own regale us with dire prophecies of what may happen if this be done or if that be not done. It is natural that each should see his own concerns as of dominant importance; as the Arabs put it, each man believes his ticks to be gazelles. Observe that he "believes," not *feigns* to believe: we may ascribe full sincerity to those who speak for legitimate special interest while at the same time we resist being stampeded into their misgivings.

MORE dangerous to the individual than any of these, however, is the psychology of recovery. Just as the psychology of depression destroyed some who might have survived, so will the psychology of recovery handicap others and, in extreme cases, even destroy some who may have survived the depression.

Such victims are most likely to be found amongst the passengers of the business cycle. These are the people to whom business is a sort of tide that carries them willy-nilly along with it. When business is good they expect to prosper; when it is bad they just know they cannot; and that is that. In this, of course, is a measure of truth. Beneath the efforts of us all there does flow a ground swell of opportunity that is beyond our influence. But the share of that opportunity that each may realize for his own is measured by the effort with which he individually supplements the general trend. That is what determines whether he will make exceptional progress, just drift with the tide or actually go down, despite the general rise, under the attack of more aggressive competition. The tide of depression or of recovery is but a circumstance, in the one case to be overcome, in the other to be enlisted as an aid.

OF all this shrewd management and keen salesmen are well aware. Management, therefore, is driving aggressively to catch the tide and strengthen its standing in the marketplace. Salesmen worthy of their calling welcome the turning tide not as an excuse for resting on their oars but rather as an ally to multiply the fruits of their own redoubled efforts. Both management and salesmen know that while stonewalling calls for one kind of effort and aggressive attack for another, success at either is not achieved without effort.

So, with recovery now well under way, with the tide of confidence consistently rising despite surface disturbances, business passes from defensive to offensive tactics and must deal with the problems of recovery rather than those of depression. But these new problems are not simply blank walls; they may well be gateways to opportunity. And men and organizations are measured not by the weight of their problems but by their resources in turning them to good account.

After all, it is just those problems that make it possible for most of us to earn a living; if business were the clear sailing for which we yearn, many of us might not be needed at all. So it is appropriate that we welcome the demands of the recovery period for aggressive effort as a challenge to test our mettle and demonstrate our right to participate in the opportunities that lie ahead. As in every such period, ample rewards await those who carry on in that spirit.

Willard Chevalier

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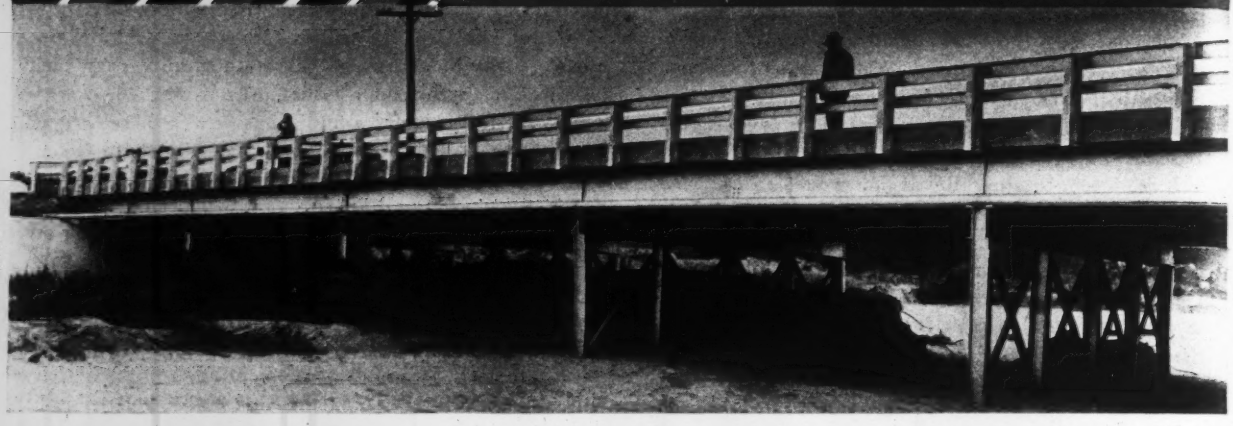
For bridges exposed to Scour

H H H -STEEL H-PILING



This bridge, at San Bernardino, Cal., is built on Bethlehem Steel H-Piles. Note the alignment and sturdy appearance of the steel H-piling bent, as shown in the lower illustration. The steel girders of the bridge rest on a cap consisting of two structural-steel channels, riveted to the H-piling.

A BRIDGE like the one shown in the two photographs, crossing a shallow stream bed, represents a difficult problem—or did, before the possibilities of steel H-piling were understood.

Dry during most of the year, at certain seasons a stream bed may become a raging torrent, causing deep scour that often undermines bridge foundations. To prevent such damage the bridge foundations must be driven deep—securely below the zone of possible scour. Steel H-piles are so useful in meeting this problem because they have strength and toughness to stand up under the continuous hard driving that is needed to force them through beds of sand and gravel to the required penetration.

The effectiveness of piers and abutments of steel H-piling for bridges exposed to scour is shown by the thousands of bridges, built on steel H-piles, that are successfully withstanding floods and freshets, year after year. Many of them replaced bridges of other types that had been weakened or destroyed by scour.

Abundant strength to withstand ice floes is another important advantage of bridge foundations built of steel H-piling.

Bridges exposed to scour represent only one of the types of foundation problems to which engineers are applying steel H-piling. It is being used for industrial plants, piers, buildings, sheeted trenches and many other kinds of construction. . . . Bethlehem Steel H-Piling is rolled in a complete range of sizes and weights.

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In the News:

CONSTRUCTION of twin vehicular tubes under the East River, connecting Manhattan and Queens in time for the 1939 World's Fair at Flushing, was virtually assured on Jan. 2 by a PWA allotment of $58,365,000. New state legislation will be required which will vest title to the tunnel in the federal government until the bonds are repaid.

THE SODIUM-VAPOR LIGHTING INSTALLATION on the San Francisco-Oakland Bridge will provide 8,000,000 lumens of light, according to the General Electric Co. This will be spread over 15 miles of double-deck bridge and approaches.

THE SOUTH PENNSYLVANIA RAILROAD, consisting of nine tunnels between Harrisburg and Pittsburgh but no track, is to be dug out of the mountain underbrush by state highway department surveyors with the avowed purpose of utilizing this unfinished relic of the fifties as a highway route. Work begins this week.

FIRST ALL-STEEL HOUSE DEVELOPMENT is claimed by Dayton, Ohio, as construction of 100 frameless steel houses fabricated by the American Rolling Mill Co. gets under way. Selling price per house is from $3,500 to $5,500.

WORK is to be expedited immediately on the "green belt" community near Bound Brook, N. J., one of the four rural-industrial communities being established by the Resettlement Administration. The announcement was made following the denial by the District of Columbia Supreme Court of a motion to restrain construction of the community.

RIVERS throughout France, swollen by torrential rains, went on a rampage of destruction early this week. On the Breton marshlands the floods reached the height of the 1910 disaster, considered the worst in French history.

THE CONSTRUCTION CENSUS of the Department of Commerce got under way this week as field men began canvassing contractors for information on construction activities during 1935. The data will chiefly concern value of work done and contracts received, as well as expenditures for materials and wages, and man-hours of employment.

TWO LONG TUNNELS found a place in the news this week. On the West Coast the 18-mile East Coachella Tunnel of the Colorado River Aqueduct of the Metropolitan Water District was holed through, and in the East the final inspection of the 20-mile tunnel of the New York City water-supply system was made, preparatory to putting the tunnel into operation. The latter tunnel, a duplicate supply line to the boroughs of Queens and Brooklyn, was completed in 1933 except for the valves and shaft equipment that have been installed with PWA funds. The East Coachella Tunnel is the longest on the Colorado River Aqueduct.

In This Issue:

TOUGH BEARPAW SHALE at the site of the huge spillway gate structure of Fort Peck Dam is being bored, sliced and carved like so much cheese. The use of an ingenious 5-ft. auger drill and power saws marks a new advance in excavation methods on a project that has been notable in the improvement of construction technique.

THOUGHTFUL PLANNING and development of sewage-disposal facilities are especially important for cities adjacent to the Great Lakes, where these bodies of water are utilized both as a source of water supply and as a receiving basin for discharged wastes. The background and present status of Cleveland's comprehensive plan for sewage treatment, with special emphasis on the Easterly project, are subjects of an article in this issue.

TVA is applying principles of erosion control developed by its forestry division to the protection and beautification of highway cut and fill slopes. Covering the slopes with a mat of brush or straw, for conservation of moisture and protection of newly-seeded surfaces, is a new development in the rapidly-growing art of highway erosion control.

EFFECTIVE MEASURES in curtailing acid pollution in streams through sealing of abandoned coal mines are being carried on under WPA direction in the Ohio River Basin. The theory and methods of air-sealing are briefly described and illustrated.

SINCE the first self-anchored suspension bridge was built in Germany 36 years ago, twelve others have been erected in various parts of the world, eight in Europe (mostly in Germany), one in Japan and four in the United States. Of the latter, three are in Pittsburgh. The fourth, in Missouri, was designed by the writer of an article in this issue. Mr. Mullins reviews the history, the advantages and the shortcomings of this interesting type of structure which, according to reports, may be represented soon by some new installations in this country.

POTENTIAL INJURY to the water supplies of Florida cities was the source of strong opposition to the ship canal across Florida when that project was authorized. As a result of this protest, a board was appointed to look into the question. The board's preliminary report finds that the canal's effect will be purely local. The water supply of no major city is expected to be affected.

AN ALL-WELDED BRIDGE TRUSS of 150-ft. span over the Raquette River on a toll highway in northern New York is the longest yet built in this country, although it is 11 ft. shorter than one in Czechoslovakia. The details of the Raquette River bridge are described herein.

STUCCO BIG FAVORITE IN TODAY'S BUILDING UPTURN

—Here's why...

● The building business is looking up. And, for both new home construction and for modernizing, there is a swing to stucco. There are sound reasons for this.

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2. Stucco is applied in any texture suited to the architectural design—floated to a smooth finish, troweled in various semi-smooth effects, tooled, stippled, spatter-dashed, rough torn, or treated in other pleasing ways.

3. With a finish coat made with *white* portland cement, any color is available in stucco—from pure white, through pastel tints of cream, salmon, tan, pink—to rich warm yellows, browns, greens, and other shades.

Add to these three the *economy* of stucco, and you've got four strong selling points that are hard to beat.

For details write Universal Atlas Cement Co. (United States Steel Corporation Subsidiary), 208 South La Salle Street, Chicago.

You may not have many jobs as palatial as this one! But we show it here as a beautiful example of stucco finish made with Atlas White—the ideal finish for modest homes as well as the finest homes. John A. Brown, Oklahoma City, is the owner of this house. Atlee B. and Robert M. Ayres, Architects, San Antonio.

STUCCO *made with* **ATLAS WHITE PORTLAND CEMENT**

US STEEL

ENGINEERING NEWS-RECORD

January 9, 1936

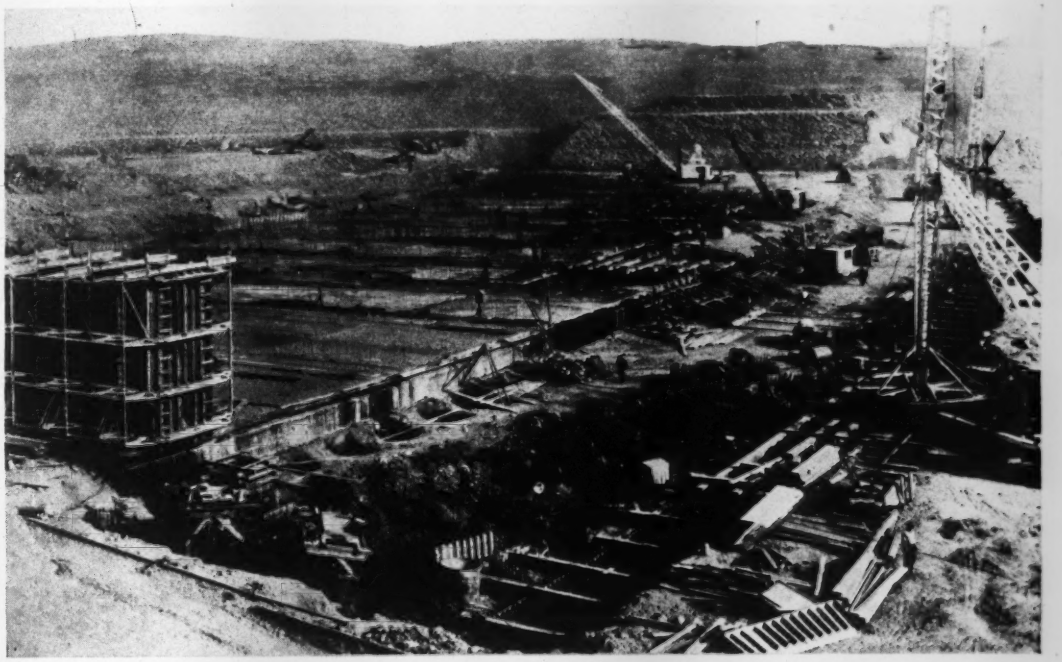


FIG. 1—SPILLWAY GATE at Fort Peck Dam, where tough Bearpaw shale is being bored and sliced with special augers and saws. In the foreground is the deep curving cutoff trench and some of the 467 cylindrical piers that will carry the gate structure; in the background, preparations are under way for placing the heavy concrete mat under the training walls.

Tough Shale Bored and Sawed for Fort Peck Spillway Gate

Novel 5-ft. augers bore deep holes for gate structure foundation piers while adapted coal-sawing rigs cut out cutoff trench and slash 4 ft. of overburden into ribbons for easy removal

THE BEARPAW SHALE at Fort Peck Dam is tough material, but it is being bored, sliced and slashed like so much cheese at the upper end of the deep spillway cut where construction of the huge gate structure that will control the flow of floodwaters from the reservoir is under way. An array of novel equipment is carving out the shale bed in a manner strange to the field of construction excavation. Dangling from the ends of 100-ft. crane booms are two power augers that pierce the floor of the cut with deep 5-ft.-diameter holes for concrete piers to carry the sixteen heavy gates. Two saw rigs, imported from the coal-mining industry and modified for this particular work, slice vertical cuts through the cutoff trench and rip a grid of long narrow channels in the 4-ft. shale overburden that covers the site of the gate, approach basin and long training walls. A third machine with a different type cutter head neatly undercuts the overburden between the vertical cuts and leaves a smooth floor for the heavy concrete foundation mats.

Spillway-gate structure

The spillway-gate structure consists of seventeen piers set on a curved line, between which are suspended sixteen 40x25-ft. stoney gates, with provision for emergency stoplog closure. Fifteen of the piers extend 130 ft. downstream to form training walls for the discharge water. The training walls rest on heavy concrete slabs extending the full width of the spillway cut. At the upstream toe of the gate is a cutoff wall 10 ft. wide and 30 ft. deep.

The approach channel to the gate structure, 820 ft. wide, will be paved with a 3-ft. mat for 220 ft. upstream. The seventeen piers rest on a solid concrete slab 80 ft. wide and 12½ ft. thick, founded on 467 reinforced-concrete cylinders 5 ft. in diameter sunk 30 to 40 ft. into the shale (Fig. 1). This foundation will carry the gate structure, even though the supporting slab should be undermined.

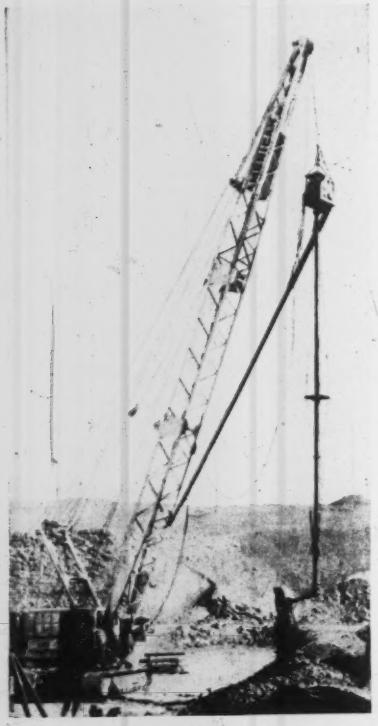


FIG. 2—JOB-MADE AUGER bores 5-ft.-diameter holes in shale for spillway gate supports. The motor and gear reducer are mounted at the top of a trussed shaft, the lower end of which is hinged to facilitate dumping of the auger pan. A telescopic arm fastened to the crane boom resists the torque of the motor drive.

The Bearpaw shale quickly slacks and disintegrates upon exposure to dry air. Because of this characteristic, a 4-ft. thickness of shale was left as a protecting cover over the entire site of the gate structure when the spillway cut was made in the spring of 1935. Removal of the cover is part of the gate contract. To check air slacking, a bituminous paint is sprayed on all faces of excavation in the shale, against which concrete will be placed as soon as exposed. This is common practice on all Fort Peck structural excavation.

Boring foundation-shaft holes

Boring of the 5-ft.-diameter holes for the concrete foundation shafts is done with two job-made augers. The cutting device is a split circular pan, 5 ft. in diameter, fitted with two sets of cutting teeth. The pan is mounted on the lower end of a 50-ft. pipe shaft; at the upper end of the shaft is a 40-hp. electric motor and reduction-gear assembly (from a 75-hp. tractor). Hog-rod trussing braces the long shaft. A coating of tungsten carbide has been welded to the cutting teeth to resist wear.

The auger assembly hangs from the load line of a long-boom crawler crane. A telescopic pipe arm extending from the gear box to a lower corner of the boom resists the torque of rotation as illustrated in Fig. 2.

In operation, the cutter is lowered to the bottom of the hole before rotation starts. After a foot or more depth is drilled, the rotating power is shut off and the whole assembly is lifted by the crane, the excavated spoil being brought up on the cutting pans. When clear of the ground, the auger is swung to one side for dumping. About 4 ft. above the pan the drive shaft is hinged. To dump the load, a locking pin on the hinge is pulled, and the end of the crane's closing line is hooked around the teeth of the cutter. Holding the load line while hoisting the closing line pulls the pan to a vertical position and dumps the load. Unhooking the dump line and replacing the locking pin prepares the auger for another digging cycle. The digging rate is about 5 ft. per hour.

As soon as the holes are bottomed, it is necessary to spray the walls with bitumen to prevent air slacking of the shale. A man is lowered to the bottom and sprays the walls with an air gun as he is slowly hoisted to the surface. The spraying process creates a dense black fog. Ventilation by a stream of fresh air blown into the bottom of the hole through a canvas vent duct forces the fog out as fast as it is created, allowing the operator to work in clear air.

Prefabricated reinforcing cages are dropped into the holes, and concrete is placed as soon as possible, before the shaft walls weaken.

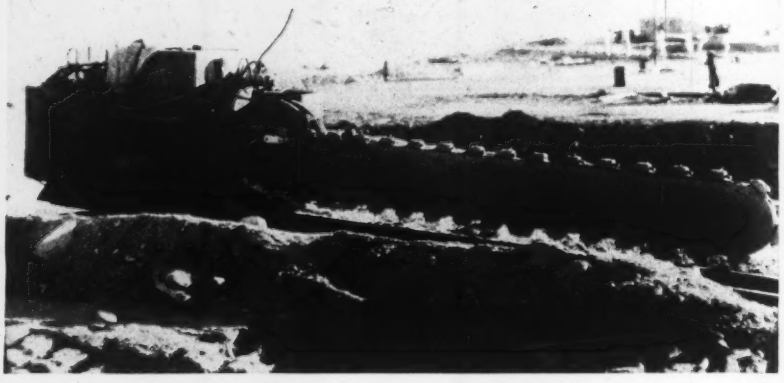
Sawing the shale

The saws for cutting out the trenches and overburden are of two types; one is for cutting vertical slots, the other for horizontal undercutting. Both types are electric-powered and are self-propelling on rails. They were developed by the Sullivan Machinery Co. for this particular work and are a modification of standard coal-cutting saws.

Two vertical cutting machines are in use. They are equipped with a chain saw having 36 half-diamond-shaped teeth, fastened to the chain by set screws, which form a kerf 3 in. wide and up to 8½ ft. deep (Fig. 3). The teeth are removable and are reversible. The saw blade is mounted on a head on one side of the machine, and can be rotated through 180 deg. of arc (from horizontal, downward to horizontal in the opposite direction). By means of adjusting screws the head can be turned to cut a slot on an angle as much as 60 deg. from the vertical.

Power is supplied by an 80-hp. 440-volt motor, fan-cooled. Propelling is by means of an anchor cable winding up on a drum. The propelling or feeding speed is 33 in. per minute. When used singly, a ballast box is required to balance the weight of the saw head and blade. On one rig the saw is on the right side, on the other it is on the left

FIG. 3—RAIL-MOUNTED SAW that cuts vertical slots in the shale overburden at the spillway gate site and also cuts out the sides of the deep cutoff trench.



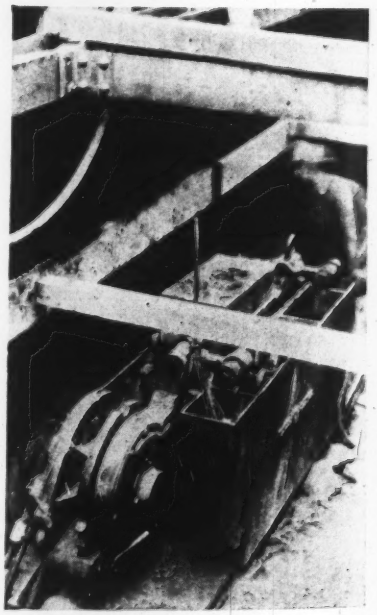


FIG. 4—VERTICAL SHALE SAW at work in the cutoff trench. After the saw cuts slots 8 ft. deep on each side of the trench, the intervening material is loosened by blasting and removed by pull shovel.

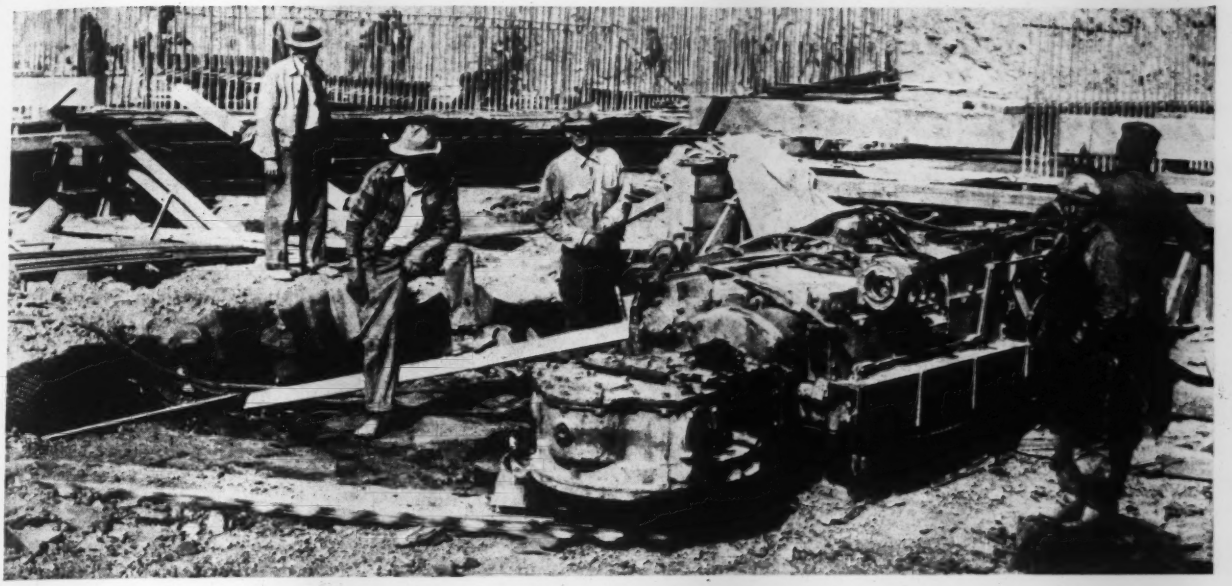


FIG. 5—SWEEPING AHEAD in semicircular cuts, this horizontal saw undercuts the shale overburden that has previously been slashed by a grid of vertical slots.

side. This permits the two to be joined back to back as a twin unit (ballast boxes removed) mounted on a skid frame sliding on the rails. The twin unit cuts two parallel slots 4 ft. apart, and this arrangement is in general use in cutting out the overburden.

In digging the cutoff trench the units are used singly. A kerf about 8 ft. deep is cut along each outer edge of the trench, and the intervening shale is loosened by light blasting (Fig. 4). A clamshell removes the spoil. The saws then make another cut, operating from the trench floor. The saw-head design is such that the rigs can work close to the trench wall, continuing the cut downward in a vertical plane. It is necessary to spray the walls as fast as they are exposed, and structural steel trench bracing is installed from the top as the trench gets deeper.

The vertical slots in the overburden are cut in advance of undercutting, the latter being done just prior to placing of concrete, leaving the floor exposed for as short a time as possible.

The undercutting machine is similar to the other type, except that it has a rotating horizontal saw head and is propelled through axle drive. It is equipped with the same size motor, and has a saw blade 8½ ft. long cutting a 3-in. kerf (Fig. 5). In operation, this rig advances into the overburden, undercutting the shale with semicircular sweeps. Working ahead of the saw is a pull shovel, which breaks and scoops up the shale as it is cut loose at the bottom. The full shovel backs up as the saw advances. Maximum traveling speed of the saw is 27 in. per minute.

Recently work on the spillway gate, which had been carried on with three eight-hour shifts daily, was shut down because of cold weather, but not until nearly 200,000 cu.yd. of shale had been sawed, bored and excavated since mid-August.

Major Thomas B. Larkin is district engineer in charge of the Fort Peck project, and Capt. John R. Hardin is engineer of spillway construction operations. The Addison Miller Co. and Fielding & Shepley, all of St. Paul, Minn., are joint contractors on the spillway gate. H. C. James is superintendent for the contractor.

Pre-Tagged and Spotted Milk Bottles Expedite Sewage-Sampling Procedure

SAMPLES of sewage from five consecutive steps in the treatment plant at Fort Worth, Tex., are taken every two hours throughout the day and night and are then made into composite samples by abstracting from each single sample a portion equivalent to the pumping rate at the time taken.

To expedite and simplify the procedure, W. S. Mahlie, chief chemist, has worked out the following scheme, using pint milk bottles that fit into a table with pockets for the twelve series of samples taken each two hours. The attendant takes a set of six bottles on his round in a milk bottle carrying crate.

SEWAGE-SAMPLING BOTTLES permanently identified with colored paints and metal tags insure accuracy in taking samples from five different points every two hours in the Fort Worth treatment plant.

The bottles are premarked in two ways. First, for easy identification a spot is painted on the bottle as shown in the picture with a definite fixed color for each point of collection. Samples are taken of raw sewage and effluents from Imhoff tanks, the aeration units, secondary settling tanks, sprinkling filters and final settling tanks. In addition to the colored spots, tin tags are attached to the neck of the bottles. On these tags the time and the place for collection are put on with an addressograph stencil. A flat chain link soldered to the tag makes a convenient loop for the wire around the neck of the bottle. Artists' oil paint is used for painting the spots, which are afterward covered with varnish. Even with all these precautions attendants occasionally get samples mixed, but the percentage of accuracy is much higher than it is when using bottles with labels or paper tags on which information must be written.

Welded Highway Bridge Trusses of 150-Ft. Span

Raquette River Bridge on international toll highway in northern New York consists of two all-welded through Pratt truss spans

By George L. Dresser
Vice-President, The Standard Engineering Corp., Albany, N. Y.

THE NEW BRIDGE across the Raquette River, about 9 miles east of Messena, N. Y., comprising an important unit in the new international toll highway connecting Cornwall, Ont., with the village of Rooseveltown, N. Y., is believed to be the longest arc-welded bridge of its kind in the world, consisting of two 150-ft. through-truss spans and a 40-ft. rolled-beam approach span at either end. The toll highway, constructed in 1933 and 1934, was the result of several years of planning and negotiations and makes possible the only highway crossing of the St. Lawrence River between Lewiston, N. Y., and Montreal. Bridges of the New York Central Railroad over the north and south channels of the St. Lawrence River are utilized, having been converted into combination railway and highway structures by the installation of new roadway decking and guard-rails and the placing of adequate safety gates and signals. The railroad company's Raquette River Bridge, about 3½ miles south, was not wide enough to accommodate the highway traffic, so that a new bridge with a 20-ft. roadway was erected at this point parallel and adjacent to the railroad bridge.

In considering the design of the new bridge, maximum initial economy consistent with sound engineering practice was the first consideration. Time was also of major importance and the construction period, as a consequence, covered the months from November to February, with temperatures as low as 50 deg. below zero; the average working temperatures during the construction period were 20 to 30 deg. below zero.

A comparison of welded and riveted designs for this bridge indicated a saving in initial cost of the welded design, and some saving in construction time.

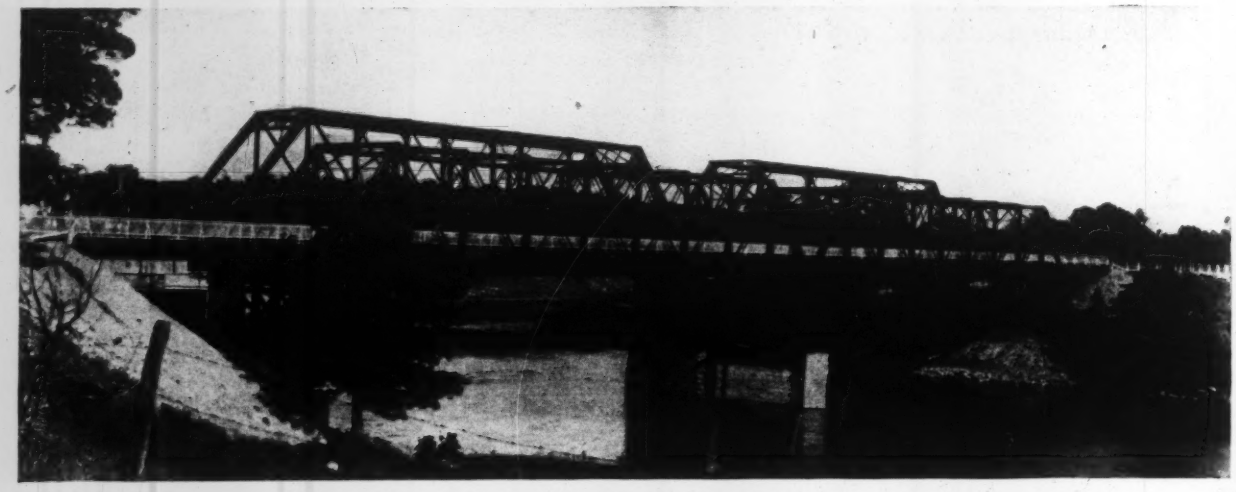


FIG. 1—RAQUETTE RIVER BRIDGE in New York, whose two 150-ft. spans are completely welded. Its 20-ft. roadway is designed for H-15 loading.

Welded construction therefore was adopted by the contractor, the Standard Engineering Corp., Albany, N. Y., and was approved by the owners, the Cornwall-Northern New York International Bridge Corp. and the New York Central Railroad Co.

Design and details

The type of structure selected was a through Pratt truss because of the simple framing. Only two web members met at both the upper and lower-chord panel points. Also, the diagonals in this truss are tension members giving some economy in material over members acting in compression.

The top chord, end posts and the verticals were made rolled sections, 12 in., 65-lb. for the top chord and end posts and 12 in. 45-lb. for the verticals. Diagonals are two angles while the bottom chords are composed of two plates, 10x⅜ in. for two panels at each end of the truss, and 10x⅞-in. for the center panels. It is apparent from the accompanying drawing that the shop preparation required for the various members was very simple, consisting mainly of punching the holes for centering and alignment bolts (two at each panel point) and coping one end of the end posts and verticals and both ends of the top struts. For the rest, plain material cut square or beveled at the end was found to be satisfactory.

All welded joints and connections were designed for the simplest type of weld, i.e. the single-pass ⅜-fillet, because experience has shown that multi-pass welds or larger welds slow up the work and increase the cost of welding to a point where the economy in favor of welded construction is lost. The only exceptions made to the ⅜-in. fillet welds were in the flange welds at the hip joint and in the top-chord splices where double-vee butt welds were utilized. To have used fillet welds in these places would have required splice plates, which would have interfered with diagonal and top-bracing connections. These butt welds were made in four passes, which is satisfactory from an engineering standpoint but is too slow and expensive for general use.

All welds were placed on the structure so as to be in the most accessible position for the welder—i.e., enough space was left around each weld so that no member interfered with the proper application of the weld metal. A welding electrode is 14 in. long, and must be held at an angle of about 30 deg. to the work; these factors had to be considered in the design of the connections.

Most of the welds on a bridge truss such as this occur either in the vertical or overhead positions. Nothing could be done in the design to change this, so

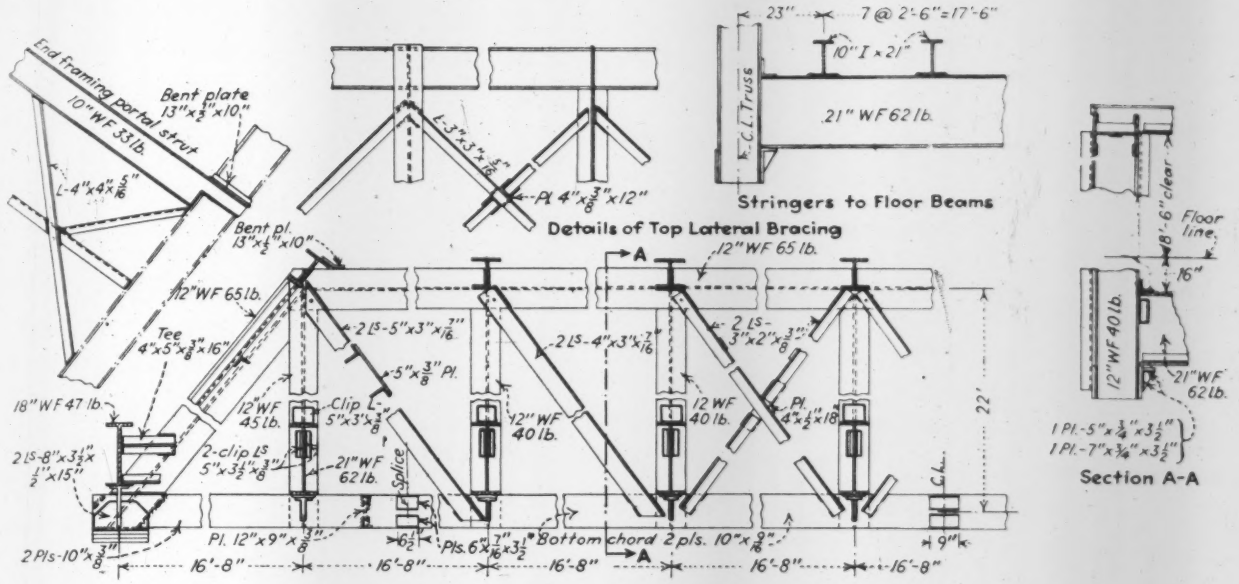


FIG. 2—WELDING DETAILS on a 150-ft. through Pratt truss highway bridge.

welds were placed as dictated by the joint requirements.

All welding was done by gas-engine-driven direct-current welding sets of 300-amp. capacity. The welding current ranged from 150 to 175 amp., with 20 to 22 volts across the arc. Bare electrodes ⅛ in. in diameter were used throughout, except for the double-vee welds at upper-chord flange splices, where covered electrodes were used. The only reason for using covered electrodes in these welds was that the welds were heavy, about ⅝ in., and the greater ductility of the covered rod metal rendered the weld less liable to crack under cooling strains. No peening or other mechanical means of stress relieving was done on any of the welds. The only precaution taken in this regard, other than keeping the size of the welds down to single-pass ⅜-in. welds, was to apply the metal alternately around the joint, so that welds which occurred opposite each other were not made at the same time. No welds cracked on this structure during erection, and two rigid inspections—a year apart—have shown no cracked welds, although the annual temperature range is about 150 deg.

The bridge was designed for two lanes of H-15 loading. The design loading adopted consisted of an equivalent loading of 450 lb. per linear-foot, and a single concentrated load of 21,000 lb. on each traffic lane. The resulting maximum chord stress was 181,500 lb.

All welds, except the double-vee butt welds in the top chord splices, were designed for a working stress of 3,000 lb. per linear-inch of weld. The vee-butt welds act in compression at the same stress as the chord and serve merely to hold the chord members in line. No welds are used in tension.

The floorbeams are 21-in. 62-lb. H-sections. These beams were furnished plain, cut to length, and all connections angles were welded in the field. The connection is simple, easily made in the field, and after two years of severe service is in perfect condition. It may be noted here that any attempt to make a perfectly rigid floorbeam connection, such as welding the floorbeam solidly to the truss vertical without the use of clip and seat angles, would most certainly have resulted in cracked welds.

The top lateral struts are framed into the top chord in the manner shown, in order to get a positive mechanical lock. The bottom flanges of the top struts (10-in. 33-lb. H-sections) must not interfere with the inside diagonal connections to the top chord, which means that at least half of the top-chord flange must be kept clear. In consequence, the top lateral struts extend slightly above the top chord. It will be noted from the plan that the web of the top lateral does not touch that of the top chord. This allows a free passage for water, and the camber of the top chord causes water to run off from the center to the ends and down the end posts. In fact, the whole structure is thoroughly drained, and all pockets where water and dirt might collect have been eliminated.

Erection procedure

In erecting the bridge the bottom chords were assembled on the bank. The floorbeams were then placed on the falsework, blocked to camber, and the stringers laid over them. Enough plank was laid over the stringers to make a working floor. The bottom-chord assemblies were then put in position, and verticals, top-chord sections and diagonals set, in the order named, and held by special heavy clamps preparatory for welding. The top lateral struts were set in place to hold the trusses.

Floorbeam connections were then welded, and additional camber was placed in the trusses by jacking and blocking up the floorbeams. Panel-point connections were welded next, and the end posts and portals were welded last.

After the structure was brought to its proper alignment in the manner noted above and the various members clamped in position, the joints were tack-welded, thus fixing the truss members in their proper positions. The centering and alignment bolts were then removed and the joints welded. All open holes were plug-welded. No bolts remained in the finished structure.

The total weight of steel in the structure is 150 tons, total welding 3,000 lin.-ft., total electrodes used 1,500 lb. The estimated saving in cost and erection time was realized in the actual structure.

The Standard Engineering Corp., Albany, N. Y., was given the contract by the owners, the Cornwall-Northern New York International Bridge Corp., New York City, to design and construct the electric welded spans and in addition the two railroad structures across the St. Lawrence River, and to build the connecting highways.

On both the design and construction of this bridge, the contractor wishes to acknowledge the valuable assistance given it by J. W. Pfau, chief engineer, and H. T. Welty, engineer of structures, of the New York Central Railroad; also by William Dalton and Andrew Vogel, of the General Electric Co., who advised on matters pertaining to electric arc-welding.

The design of the bridge was made by the late Walter R. Marden, chief engineer of the Standard Engineering Corp., and the electric arc-welding details were planned by O. M. Bloch, consulting engineer of the corporation.

Mine-Sealing Program to Reduce Acid Pollution in Streams

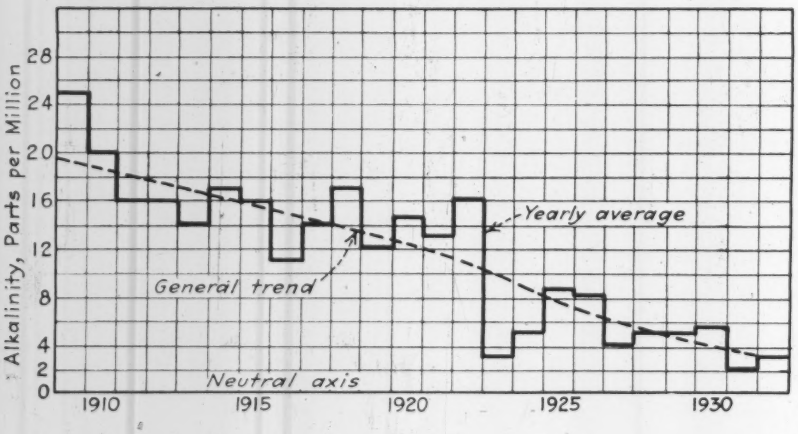
Discharge of 3,000,000 tons of sulphuric acid per year from abandoned coal mines in the Ohio River Basin to be curtailed with funds provided by WPA

WITH the objective of effecting a material reduction in the estimated flow of 3,000,000 tons of sulphuric acid which pour each year from abandoned coal mines into the streams and rivers of Pennsylvania, Ohio, Kentucky and West Virginia, an allotment of $2,500,000 has recently been approved to carry on a large-scale mine-sealing program under the direction of the Works Progress Administration.

The present undertaking is a continuance of work inaugurated by the CWA in the winter of 1933 and carried on by FERA during the past year in a region where the toll exacted by mine-waste drainage is conservatively estimated at $10,000,000.

Acid is created in the mines through the oxidation of iron pyrites, which are present in large quantities in the ore materials of most coal veins. The iron sulphate thus formed is taken up in solution by water seeping in from the surface and converted into sulphuric acid. This acid-laden water occurs in such large quantities that mechanical means have to be employed to pump it from most active mines, and in inactive or abandoned mines it simply accumulates until it overflows at the mine portal. In either event the poisonous waste flows unhindered into the nearest stream and finds its way eventually into the Ohio or one of its main tributaries. It often has a concentration of as much as 5,000 p.p.m. of free sulphuric acid.

FIG. 1—EFFECT of acid mine drainage is graphically shown by the decreasing alkalinity values of the Alleghany River water at Aspinwall, Pa. It reached its greatest proportion in 1931, when the yearly average of alkalinity was only 2.0 p.p.m.



Acid pollution surveyed

The total acid discharge for the four-state area was estimated by the U. S. Engineers Corps in 1925 to approximate 3,000,000 tons annually. This was arrived at through an intensive study of acid pollution in the Pittsburgh district, where accurate measurements (using the methyl-red indicator method) showed a burden of 404 tons of free acid in the waters of the Monongahela River passing Dam No. 2 each day. The engineers concluded that there were between 40,000 and 50,000 abandoned mines in the area as a whole, and that these were responsible for not less than 70 per cent of the pollution. Active and marginal mines accounted chiefly for the remainder, with sewage and industrial waste making only a small contribution to the total.

The damage caused by this pollution has mounted progressively each year, and experts of the U. S. Public Health Service feel that the engineers' 1925 estimate of $10,000,000 may be short by 50 per cent of the actual loss to public and private property which the acid each year exacts. The damage toll is reflected in the increased costs of purification of public water supplies, corrosion to boiler tubes and other industrial equipment, destruction of the metal parts of dams and locks and of highway culverts and bridge supports. In addition, streams have been made totally unfit for stock watering, and the toxicity of the acid has destroyed all fish life.

The practicability of mine sealing as a corrective for this form of acid pollution was demonstrated fifteen years ago by the Engineers Corps and later by the U. S. Bureau of Mines. It has long been advocated by these two agencies as well as the U. S. Public Health Service, which sees in the situation a serious menace to public health. It was not until the CWA was organized, however,

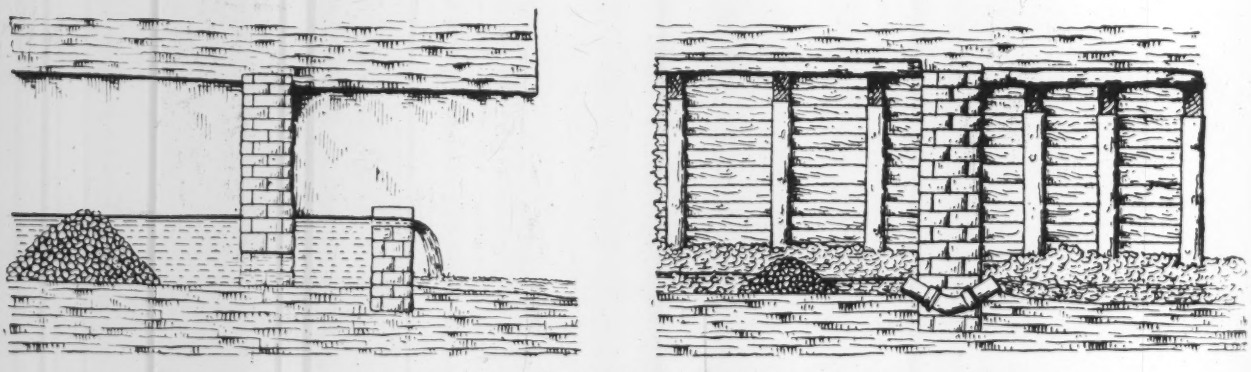


FIG. 2—TWO METHODS used to exclude air from the mines and thus to check the formation of sulphuric acid. In both, a masonry wall just within the shaft entrance is sealed tightly on all sides save for an opening at the bottom. The water trap formed at this point, either by a small dam or a curved pipe, prevents the entrance of air but permits water to flow out freely.

FIG. 3—JOBLESS MINERS, paid with WPA funds, are employed in building these masonry walls used for sealing abandoned coal shafts. The average cost per seal throughout the Appalachian field has been about $40.

with its abundance of funds and man power for public works, that a beginning was made.

Air sealing has been adopted as the most practical means of combating the formation of acid. This is based on the theory of excluding air from the mines and thus checking the oxidation of the pyrites. The practice usually followed is to build a heavy masonry wall just within the mine entrance, sealing it tightly to the walls on all sides save for a portion about 2 ft. square at the bottom. A water trap is built around the outside of this aperture. Thus, water is permitted to flow freely out of the mine as it accumulates, but the air is prevented from getting in.

There are numerous variations of this type of seal, such as using a curved section of sewer pipe under the wall or building a simple enclosed pit and dam to catch the flow, but air sealing is the basic principle followed. Flooding has been abandoned because of the obvious hazard of a break-over into neighboring shafts where men might be working. Naturally, sealing the entrance is the most important part of the job, but air shafts and other surface openings also have to be closed if oxidation is to be completely checked.

It has been found that waters coming from mines that are properly sealed in this manner lose as much as 50 to 80 per cent of their acidity in the first 60 days.

The mine-sealing program of the WPA is under the technical supervision of the U. S. Public Health Service, as were the CWA and FERA programs. Officials of this agency predict that if the program is carried out according to plan, the problem of acid pollution in the Ohio River Basin will be largely solved.

Highway Cut and Fill Slopes Treated to Check Soil Erosion

Banks fertilized, seeded and mulched with brush or straw to prevent soil washing in highway erosion-control program of Tennessee Valley Authority

TO CURTAIL soil washing of cut and fill slopes on relocated highways and other roads in the Norris Dam Reservoir area, the Tennessee Valley Authority is applying erosion-control technique that has been developed by its forestry division to the exposed banks.

The method consists of fertilizing the slope, seeding to grass, mulching with straw, woods litter or weeds held in place by brush and staked wire, and later planting to vines, trees or shrubs. Cuts and fills on 25 miles of highway have already been treated, and plans call for protection of an additional 75 miles of road in the next two years.

Mulching reduces the rate of evaporation of surface moisture and prevents the formation of an erosion pavement, allowing greater percolation to take place. Experience shows that, by the use of mulch, stands of grass can be established on subsoil more readily than by fertilization alone. The best results, however, are obtained by use of both mulch and fertilizer.

Cut and fill slopes are treated much alike. On cut slopes the stakes are driven every 2 to 4 ft. in horizontal rows 3 ft. apart, vertical rows being staggered. The stakes provide a foothold for the workers and, with the aid of cross-wiring, hold the mulch in place (Fig.1). After the stakes are in place, a light covering of mulch, just enough to cover the ground, is spread over the slope, held in place with brush. Cedar brush 3 to 4 ft. long, abundant in the area, makes a tight but porous covering that will decay completely and provide a humus layer in a few years. Over the brush, baling wire is run from stake to stake, and the stakes are then driven down so that the wire holds the brush and mulch firmly in place. Where fertilizer is used, a light application of a commercial 4-8-4 mixture at 400 lb. per acre precedes the seeding to grass.

Erosion is appreciably retarded by mulching alone, and in order to keep crews busy, mulch and brush are sometimes applied when seeding is impractical, as during continued dry spells and in winter. The first rains readily and uniformly wash the later application of seed through the cover.

A grass mixture has been developed for each season of the year, though early spring is the best time for seeding. The early spring mixture contains sericea, Korean, and Tennessee "76" lespedeza, orchard grass, red top or herds grass, and Italian rye grass. For late spring planting the Italian rye is dropped from the mixture. In late fall Italian rye, orchard and red top grasses and white Dutch and crimson clovers make up the formula. These mixtures are adapted to the acid soils which predominate in the Norris Basin. It is planned to try the application of ground limestone preceding the fertilizer. If this is done, it will probably so change the soil that other grass mixtures may be used.

Honeysuckle and other vines and shrubs constitute the final planting on cut slopes and are planted during any favorable season after the grass is sown. The plants are set in holes dug 8 in. deep with a post-hole digger, on 4x4-ft. staggered spacing, the holes being filled with top soil to encourage better growth.

Treatment of the flatter fill slopes is slightly different. On the outside of a curve or on tangent, the mulch alone has proved satisfactory without the use

FIG. 1—EROSION CONTROL OF SLOPES on TVA highways starts with staking of bank (above) to hold application of mulch mat of brush and straw (below). Slopes are fertilized and sown to grass seed, usually before placing of mulch mat. Ultimately vines and trees will be planted on treated slopes.

FIG. 2—MASONRY CHECK DAMS were built in the drainage ditch along this old road to stop further gullying; the side slope was treated to stop bank washing. In four months a growth of grass and weeds had completely obscured the dams and the brush, an indication of the effectiveness of the erosion control.

of brush and wire; but on fill slopes along the inside of a curve it has been found necessary to follow the complete cut-slope procedure because the super-elevation sheds nearly all the water to this slope. The addition of Bermuda grass sod on fill slopes is desirable, but because of occasional objections by land owners, it is not always used.

The first roadside erosion-control work done by the TVA Forestry Division was on the bank of an old secondary road. In many places washing surface water had gouged out the ditch at the foot of the cut slopes along this road to a depth of 6 ft. and to a width of 10 ft. Masonry check dams were constructed in the ditch to stabilize the water channel, and the bank was graded to a 1:1 slope (Fig. 2). The ditch and road bank were seeded to grass, and mulching was applied late in January, 1935. Within six months the washing in the ditch and on the road bank had been checked by a growth of grass, clover and other legumes, which had reached a height of 10 to 12 in. and formed a heavy sod.

Last July a 12-ft. cut and a 20-ft. fill were mulched and planted. Two months of extremely dry weather followed the sprouting of the grass seed, but the shade protection and conservation of moisture provided by the mulch enabled the grass to live through this dry spell and develop a good sod for winter protection.

Erosion control effective

The effectiveness of erosion control on the protected banks is impressive. In addition to the general benefits of improved appearance and reduction of stream silting, savings in maintenance in cleaning out highway drains and ditches largely offset the cost of erosion control.

Labor and material requirements for 1½ miles of 16-ft. road (excavation, 8,000 cu.yd. per mile) furnish an approximation of cost of the work. Civilian Conservation Corps labor, working 400 man-days, seeded and mulched 25,000 sq.yd. of slope. Materials used were 10 tons of straw, cedar brush obtained locally, 500 lb. of fertilizer, 100 lb. of grass seed, and sufficient baling wire and stakes to hold the mulch securely in place.

Drainage from the TVA's relocated roads is being handled to prevent erosion of neighboring lands. All ditches that might gully are either dammed or rubble-paved, and storm drainage is carried along the ditches to discharge channels which usually have non-erosive paved bottoms (Fig. 3).

The slope treatment and drainage work eliminate bare, unsightly cuts and fills and prevent formation of dangerous gullies in the roadside ditches. The technique is still far from perfect, and other methods of control are being tried.

FIG. 3—PAVED DITCHES to conduct stormwater away from the highways to natural drainage courses is another step in TVA's erosion-control program.

The Self-Anchored Suspension Bridge

A review of its history and an analysis of its characteristics indicate that it has advantages that recommend it for wider use than it has enjoyed—Of the thirteen bridges of this type in the world, four are in the United States

By Howard Mullins
Jefferson City, Mo.

THERE have been built in Europe and the United States, during the past twenty years, a number of suspension bridges whose distinguishing feature is the elimination of all external anchorage and the substitution therefor of a stiff column running the full length of the bridge, to which the ends of the cables are anchored. The purpose of this column is to resist the horizontal pull of the cables and also prevent excessive deformation of the floor under partial uniform or concentrated loading. This type of bridge has been appropriately called the self-anchored suspension bridge.

Little has been written in English concerning this novel type of suspension bridge, and the action and design of the type do not appear to be widely understood by American engineers. This may perhaps account for the fact that only four bridges of this type have been constructed by the English-speaking nations of the world, and all of these are in the United States.

This type of suspension bridge appears to have been originated by the late Austrian engineer, Josef Langer, who Prof. Mehrtens in "A Hundred Years of German Bridge Building" describes as "an engineer of inventive genius, though often misunderstood at his time." Langer used this type of structure for his Wrsowic Bridge on the Franz Joseph Railway built in 1870. This bridge, however, differs from all the self-anchored designs built since that time in that the cable is attached to the stiffening girder near the center of the main span as well as at the ends.

FIG. 1—FIRST SELF-ANCHORED suspension bridge built in 1899 at Lübeck, Germany. The suspension member is a stiff riveted structural type, now obsolete.

The Mühlenthor Bridge over the Elbe-Trave Canal at Lübeck, built in 1899 and illustrated in Fig. 1, was the first bridge of true self-anchored type built.

The first long-span bridge of this type, the Cologne-Deutz structure (Fig. 2) over the Rhine, completed in 1915, is, in the writer's opinion, one of the most beautiful suspension bridges ever built. The construction of this bridge appears to have cleared the way for the building of the world's longest-span self-anchored suspension bridge, the Cologne-Mülheim (Fig. 3) with a main span of 1,033.46 ft., which was constructed over the Rhine in 1929 (*ENR*, Jan. 2, 1930, p. 41). The most recent European self-anchored suspension bridge, constructed over the Save River between Belgrade and Zemun in 1934 and named in honor of the late King Alexander I, bears a striking resemblance to the Cologne-Mulheim structure.

An important self-anchored suspension bridge (Fig. 4), which greatly resembles the Cologne-Deutz structure, was constructed over the entrance to the port of the River Spree, called Humboldt-Hafen, in 1927; it is known as the Admiral Scheer Bridge.

Use in United States

This type of suspension bridge was introduced into the United States by Messrs. V. R. Covell, A. D. Nutter and T. J. Wilkerson for the Seventh St. bridge over the Allegheny River at Pittsburgh (Fig. 5 and *ENR*, Dec. 18, 1924, p. 995, and Sept. 23, 1926, p. 502) whose construction was followed by two similar structures, up and downstream at 6th and 9th Sts.

A light highway self-anchored suspension bridge was completed in 1933, over the Little Niangua River in Missouri (Fig. 7 and *ENR*, Sept. 28, 1933, p. 667).

A list of the self-anchored suspension bridges built to date, with principal dimensions, is given on p. 47.

No general rule can be stated as to

Maschinenfabrik Augsburg Nurnberg A.G. Photo.

FIG. 2—FIRST LONG-SPAN self-anchored suspension bridge, built in 1915 and known as the Cologne-Deutz Bridge. Eyeplate suspension members are used.

Machinenfabrik Augsburg Nurnberg A.G. Photo.

FIG. 3—COLOGNE-MULHEIM BRIDGE over the Rhine, whose main span of 1,033 ft. is the longest for this type of suspension bridge. Prestressed cables are used.

Hein Lehman & Co. A.G. Photo.

FIG. 4—ADMIRAL SCHEER BRIDGE in Berlin, whose suspension member is of eyeplate construction. Rocker towers are used, and the stiffening girders are of continuous box section.

when the self-anchored bridge will be more economical than the external-anchored type, since there are so many factors to be considered—height of bridge, cost of anchorage, live loads, type of cable and erection conditions—but it is believed that the field for the self-anchored suspension bridge with straight or slightly cambered stiffening girder is below about 800-ft. span.

On the other hand, Prof. Gregory G. Krivoshein of Prague submitted in 1910 a design for a self-anchored combined suspension and arch bridge of 1,758-ft. span for the St. Lawrence River crossing at Quebec. Since that time Professor Krivoshein has prepared many designs of this type of bridge, ranging from one of 236-ft. span over the Tver River in Russia to a 4,000-ft. span for a Golden Gate crossing in California. He discusses this type of bridge at some length in his book, "Simplified Calculation of Statically Indeterminate Bridges," where he says, "Briefly, we can assert that the ordinary suspension bridge with stiffening girder is about 70 per cent dearer than the self-anchored combined suspension and arch bridge." However, he notes an exception, "if the cables are to be anchored in rock. In this case the costs of the ordinary suspension bridge and of the self-anchored combined suspension and arch bridge are the same." It has not, however, been demonstrated by actual construction that such a large saving would actually be realized by the use of this type of bridge. A perspective view of one of these proposed sef-anchored combined suspension and arch bridges designed by Professor Krivoshein is shown in Fig. 9.

Advantages of the type

A few of the more important advantages of the self-anchored type bridge are as follows:

1. All external anchorage is eliminated, reducing the bridge to a self-contained unit and making it available for use in any location where the conventional truss or cantilever type is ordinarily considered the solution. For locations where the distance from suitable foundation material to grade is comparatively great, the elimination of external anchorage becomes very important, and while it is necessary to place additional material in the girders to care for the direct compression it nevertheless places the suspension-type bridge among those to be considered.

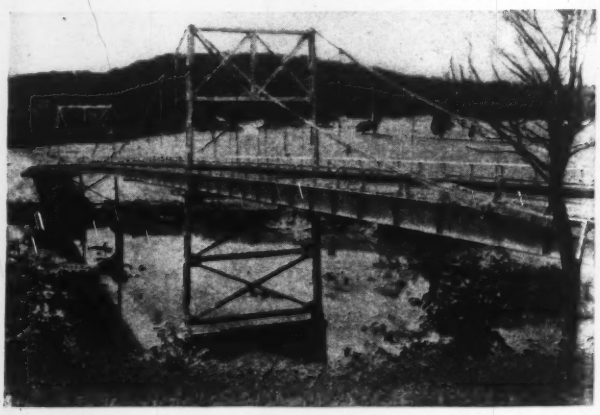
2. There are many locations where the use of the suspension-type bridge is highly desirable for economic or esthetic reasons but where a reasonable doubt exists as to the sufficiency of the foundation material to resist the horizontal cable tension. In such locations the self-anchored suspension bridge is an excellent solution.

3. It is often necessary to provide a high-level structure over a navigable river or canal. For such locations, especially where the surrounding land is flat, it will generally be necessary, except in the case of large monumental structures, to locate the anchorages, of an external-anchored type bridge, a considerable distance back of the ends of the side spans. This will require that the cables be carried an extra idle distance from the ends of the side spans to reach the anchorage. This will also require a large amount of extra metal for the construction of rocker or other type bents at the ends of the side spans to support the cables. The self-anchored type bridge is a very economical solution for this case. Such a layout is shown in Fig. 8.

4. For wide roadway bridges the use of the self-anchored (or the external-anchored) type bridge will create a saving in metal due to the elimination of all overhead bracing. In this consid-

FIG. 5—PITTSBURGH BRIDGES over Allegheny River were first self-anchored type in the United States. View shows Seventh St. Bridge complete and Ninth St. Bridge under construction. Note resemblance to Cologne-Deutz Bridge.

FIG. 6—BRIDGE of light design over Little Niangua River in Missouri. Rolled-section stiffening girders and open-type prestressed-strand cables are distinguishing characteristics. This is the only bridge of this type in America outside of Pittsburgh.



eration the advantage of the suspension type cannot be measured by the saving in weight alone, as a vast gain is also made in esthetic value.

5. The use of the self-anchored type bridge permits the transfer of a part of the material ordinarily used in the anchorages of the external-anchored bridge to the superstructure, where it may be arranged, to some extent, according to architectural taste, and where it will emphasize the inherent natural beauty of this type of structure.

6. The self-anchored suspension bridge, except the towers where they are fixed, is not stressed by uniform change of temperature in the cables and stiffening girders.

7. The self-anchored suspension bridge can be more expeditiously analyzed than the external-anchored type, as it is accuratey determined by the elastic theory.

Disadvantages of the type

In any consideration of the economics of this type of structure it is necessary to examine closely the following disadvantages:

1. In general, it will be found necessary to erect the stiffening girders of the self-anchored suspension bridge on falsework. For river or lake crossings where the depth of water is great, or where extremely wide openings are required for navigation, the cost of erection on falsework may preclude the use of the self-anchored type bridge. The important exception to this occurs in the case of eyebar or eyeplate cables where it is possible to erect the side spans on falsework and then erect the main span as a cantilever from each tower to closure at the center of the span. This method will require the use of temporary diagonal compression members in each panel between the cable and stiffening girders and also an overhead lateral system. Furthermore, it will generally be necessary to provide for jacking at the point of closure of sufficient magnitude to produce the total dead-load compression in the girders. The method is not applicable in the case where wire or strand cables are used. This method has been demonstrated in the erection of the Sixth, Seventh and Ninth St. bridges in Pittsburgh (Fig. 5).

Photo by Prof. Yutaka Tanaka.

FIG. 7—SELF-ANCHORED BRIDGE in Tokyo over the Sumida River. The box-section girders are provided with three hinges in the main span. Suspension member is of eyeplates, and towers are of rocker type.

2. There is likely to be more risk involved in the erection of the self-anchored suspension bridge than for the external-anchored type, since the stiffening girders for the former are erected first and the cables placed later, thus exposing the falsework to the hazard of floodwater for a considerable length of time.

3. Horizontal forces applied to the stiffening girders are not transferred through the cables to the anchorages, as in the case of the external-anchored type bridge, but are delivered through one of the towers to the pier (Sixth, Seventh and Ninth St. bridges, Pittsburgh, and Cologne-Mülheim Bridge) or through the girders to one of the abutments (Little Niangua River Bridge). If the height from the top of the pier to the roadway level is great, the towers will probably be comparatively slender, and it will not be practical to fix the bridge to either of the towers due to the large bending stresses produced and the tendency to produce

SELF-ANCHORED SUSPENSION BRIDGES OF THE WORLD

European Bridges

Name and Location	Year Built	River	Length, Ft. Main Span	Length, Ft. Side Span	Sag of Suspension Member, Ft.	Suspension Member	Depth of Stiffening Member, Ft.	Stiffening Member	Towers	Side-Span Condition	Literature
Mühlenthor Lübeck, Germany	1899	Elbe-Trave Canal	137.75	64.51	18.79	Riveted	4.30	Continuous Warren Truss	Rocker	Loaded	*Zeitschrift des Vereines deutscher Ingenieure*, 1900. *Eiserne Brucken*, 1911.
Napageld Austria	1910	March	118.11	68.90	13.12	Riveted	5.62	Continuous Truss	Rocker		*Eisenbau*, 1910.
Koln-Deutz Cologne, Germany	1915	Rhine	605.18	302.59	70.67	Eyeplate	10.50	Continuous Girders	Rocker	Loaded	*Zeitschrift des Vereines deutscher Ingenieure*, 1920.
Lippstadt Germany	1917	Lippe	181.07	37.72		Riveted		Three-hinged Truss			*Die Bautechnik*, 1923.
Admiral Scheer Berlin, Germany	1927	Spree	315.95	121.07	35.11	Eyeplate	7.18	Continuous Girders	Rocker	Loaded	*Die Bautechnik*, 1932.
Forst Germany	1927	Neisse	129.89	64.94		Eyeplate		Continuous Truss			
Koln-Mülheim Cologne, Germany	1929	Rhine	1,033.46	298.65	113.19	Prestressed Locked-Wire Strands	19.69	Cantilever Girders	Rocker	Unloaded	*Der Bauingenieur*, 1929; Mohringer, *Bridges of the Rhine*
King Alexander I Belgrade, Yugoslavia	1934	Save	856.31	246.07	92.08	Prestressed Locked-Wire Strands	14.04	Cantilever Girders	Rocker	Unloaded	*Der Bauingenieur*, 1930.

Asiatic Bridges

Kiyosu Tokyo, Japan	1928	Sumida	300.00	150.00	42.00	Eyeplate	8.5	Three-hinged Girders	Rocker	Loaded	*ENR*, Oct. 3, 1929. *World Engineering Congress*, Tokyo, 1929, Vol. X, Part 2, Public Works

American Bridges

Seventh St. Pittsburgh, Pa.	1926	Allegheny	442.08	221.36	54.29	Eyebar	9.21	Continuous Girders	One Fixed One Movable	Loaded	*ENR*, Dec. 18, 1924; Sept. 23, 1926.
Ninth St. Pittsburgh, Pa.	1927	Allegheny	430.00	215.00	52.80	Eyebar	9.04	do	do	Loaded	
Sixth St. Pittsburgh, Pa.	1928	Allegheny	430.00	215.00	52.80	Eyebar	9.04	do	do	Loaded	
Little Niangua Macks Creek, Mo.	1933	Little Niangua	225.00	112.50	25.00	Prestressed Wire Strands	2.75	Two-hinged Girders	Fixed	Loaded	*ENR*, Sept. 28, 1933.

an oscillating structure under horizontal load. On the other hand, if the height from top of the pier to the roadway level is small, it is best not to fix the bridge at either of the abutments, because of the large bending stresses set up in the far tower due to temperature. This statement does not hold in the case of rocker towers.

4. For the same degree of stiffness, the bending moments for the self-anchored type bridge will be larger than for the external-anchored type by approximately the difference between the elastic and deflection theories. This consideration decreases in importance as the span length decreases, and may also be partly corrected by the use of camber.

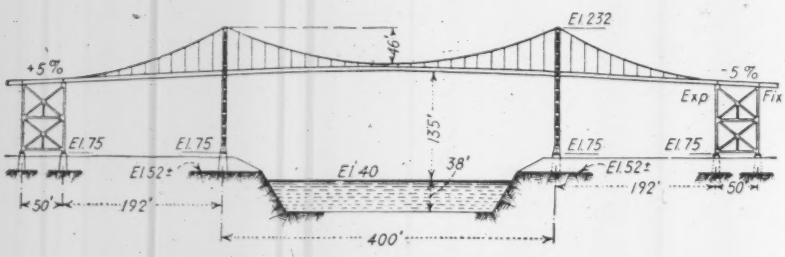


FIG. 8—APPLICATION of self-anchored bridge design to a navigable canal location, where high shipping clearance and low banks are controlling conditions.

Structural details

Floor system—Any type of floor can be used with the self-anchored suspension bridge, although it is perhaps false economy to use a wood floor since a fire of any consequence is almost certain to result in the collapse of the structure. In this type of structure the dead load does not serve to reduce the bending moments to such an extent as in the external-anchored type bridge and a light floor is therefore desirable.

Lateral System—In the self-anchored suspension bridge the lateral system is analogous to the lacing of an ordinary structural compression member. In addition to carrying the shear from lateral and wind loads, the lateral system must be sufficiently rigid to stay the stiffening girders against buckling as a long column. In this respect the type of floor used must again be considered; obviously, the greater the lateral rigidity of the floor system, the less will be required of the lateral system. The total lateral shear value, at any point, of the floor and lateral system combined, should not be less than about 2½ per cent of the total direct compression in both stiffening girders.

Stiffening Girders — The stiffening girder, or truss, for the self-anchored suspension bridge is one of the major stress-carrying members of the structure, and its failure will cause the immediate collapse of the whole structure. It is therefore necessary to examine carefully each factor in the design and make-up of the girders for this type of bridge.

The more important types of stiffening member suitable for use with the self-anchored suspension bridge are: (1) the solid web girder (single web or box type), (2) the Warren truss, (3) the Pratt truss, and (4) the Vierendeel truss.

Designers in the past have given preference to the solid web girder, although the Mühlenthor Bridge at Lübeck (Fig. 1) made use of the Warren truss as do the bridges at Lippstadt and Forst, Germany. To the writer's knowledge, the Vierendeel truss, in spite of its superior esthetic value, has not been used for the stiffening member of any suspension bridge; it probably will not be widely used until a simplified method for its analysis is brought forth.

For light highway bridges of spans up to about 250 ft., where extreme rigidity is not required, the large rolled sections now available may be used for the stiffening girder. For spans greater than about 250 ft. it will be necessary to use built-up girder sections, to obtain sufficient stiffness. The single web-stiffening girder will require additional web stiffening as the depth increases, and for this reason it has been found more economical, for the longer-span self-anchored bridges, to use a box type stiffening girder.

It is not considered neecssary in the design of this type of girder to maintain a web-plate thickness of 1/30 of the clear distance between flanges, as is the case for ordinary compression members where the whole section receives maximum stress simultaneously, because only about one-third of the total stress in the girder will be caused by the direct compression, and the remainder will result from bending. The maximum stress will always occur in the flanges, and the web stress will always be considerably less than the flange stress. In this respect the solid-web stiffening girder for the self-anchored suspension bridge is analogous to the solid-web arch.

Self-anchored suspension bridges have been built with three-hinged, two-hinged, cantilever and continuous stiffening girders. The three-hinged type is used for the Sumida River Bridge (Fig. 7), which has a hinge at each tower and at the center of the main span, and for the bridges at Lippstadt and Forst, Germany. Likewise the single example of the two-hinged type is the Little Niangua River Bridge. This is also the only self-anchored suspension bridge with rolled-section stiffening girders. The Cologne-Mülheim Bridge has straight backstays, and the stiffening girders are of the solid-web box type with a hinge in the side span 43.04 ft. from the tower. A load at any point in the side span of this structure will produce a negative moment in the girder at the tower; it is therefore appropriately called the cantilever-type girder. As examples of the continuous girder we have: the Admiral Scheer Bridge, the Cologne-Deutz Bridge, and the three bridges over the Allegheny River at Pittsburgh.

Unless the conditions are very unusual, the continuous stiffening girder is the most logical, scientific and economical type. For the same material the continuous girder will give a more rigid structure than the two- or three-hinged girder. It also tends to distribute the moments more uniformly over the length of the girder, thus resulting in a more nearly uniform girder section. The elimination of all hinges in the girders is very desirable, as they produce a sharp break in the elastic line of the deformed girder and are likely to be troublesome and expensive to detail and fabricate.

The Suspension Member — Self-anchored suspension bridges have been constructed with many different types of suspension member. The first two (Mühlenthor and Napageld) made use of a riveted and somewhat stiff suspension member—a type that is not used in present-day suspension-bridge practice. European engineers appear to have favored the eyeplate type of suspension member for self-anchored suspension bridges, as exemplified by the Cologne-Deutz and Admiral Scheer bridges, up until 1929 when prestressed strands of the locked-wire type were used for the Cologne-Mülheim structure. The eyebar type of suspension member was also used on the three Pittsburgh bridges.

The Little Niangua River Bridge is the only self-anchored suspension bridge in which prestressed strands in an open arrangement have been used. The advantages of the open type of suspension member have previously been enumerated by the writer (*ENR*, Sept. 28, 1933), and by Charles M. Jones (*ENR*, Feb. 22, 1934).

It should be noted that where eyeplate or eyebar construction is used the working stress will be only about one-third of that used for prestressed strands or parallel wire cables. Also the modulus will be about one and a quarter times that of the strand cable. Therefore, the eyebar or eyeplate suspension member will give the stiffer structure and should result in some economy in stiffening girder moments. However,

FIG. 9—PROPOSED DESIGN combining a self-anchored suspension bridge and an arch for a bridge over the East River at New York by G. G. Krivoshein.

the increased value of the horizontal tension, due to the greater weight of suspension member, will consume some of this saving. Moreover, where wire or strand cables are used with the self-anchored type bridge, the field computations and adjustment for erection of the cable may be more complicated than for the external-anchored type bridge, due to the fact that the ends of the cable move with each change of temperature. This produces simultaneously a change of sag and a change of span. This will indicate that the eyebar or eyeplate cable is particularly suited to the self-anchored type bridge from an erection standpoint, as no sag or other computations are necessary; the links of the cable are fabricated to a definite length, and it is only necessary to erect and insert the pins.

In the two cases where prestressed strands have been used in combination with the self-anchored type bridge—namely, the Cologne-Mülheim and Little Niangua River—difficulty was experienced in the adjustment of the strands. In the former case the cable, when set to the prestressed measurements and saddle markings, was found to swing about 20 in. above the calculated position at the center of the main span, thus requiring additional jacking of the stiffening girders for connection of the hangers.

It is believed that this difficulty may be accounted for, in part at least, by the fact that the strands undergo considerable handling after prestressing—reeling, unreeling and hoisting during erection—and thereby regain some of the non-elastic elongation removed by prestressing. The use of wire or strand cables, however, will eliminate the use of falsework or temporary cables for cable erection.

Thin Flat-Slab Floors Prove Rigid Under Test

By Walter H. Wheeler
Consulting Engineer, Minneapolis, Minn.

LOAD TESTS recently made on the floors of two buildings in which the "smooth ceiling" type of flat-slab floor construction is used to carry light loads, and with irregular spacing of columns, indicate remarkable stiffness of this type of floor.

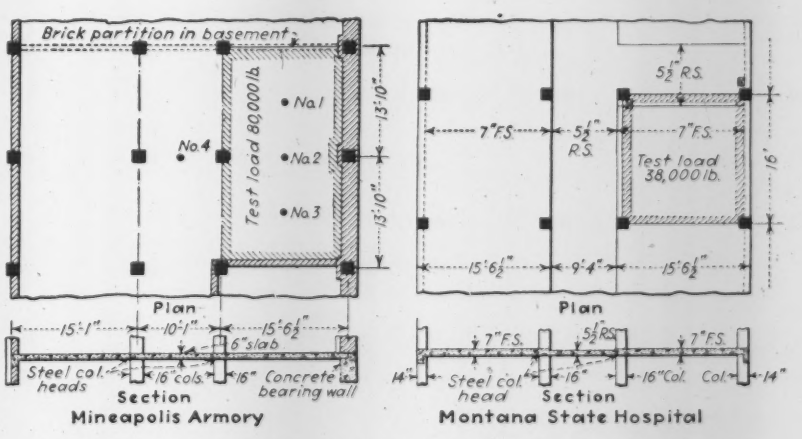
Two panels of the first floor of the office-building portion of the Minneapolis Armory were tested as indicated in the drawing. Two adjacent wall panels were loaded with twice the design load or 200 lb. per sq.ft. The slab is supported by a concrete bearing wall at the outside edge. The basement story under the test panels is 22 ft. 6 in. clear height. The reinforced-concrete columns are 16 in. in diameter, without special reinforcement for bending. Steel column heads enclosed within the depth of the slab take the place of the usual concrete capitals. Deflections were measured with a steel rod pointed at the bottom to fit steel plugs in the floor, using an Ames dial attached to the top of the rod so that the plunger contacted a pencil mark on the concrete ceiling. The results of the test are shown in the accompanying tabulation.

One panel at the second-floor wall of the Receiving Hospital, Montana State Tuberculosis Sanitarium, Galen, Mont., was tested with twice the design load, or 160 lb. per sq.ft. over the full area of the panel, as also shown in the drawing. The rough floor slab is 5½ in. thick. Terrazzo finish is used in the corridor and some of the side rooms, but most of the rooms have rubber-tile floors. Where rubber tile was to be laid, the slab was poured and finished 7 in. thick; it was left down 1½ in. for the terrazzo. The panel tested was partly 7-in. finished and partly 5½-in. rough slab. There is a vent opening through the slab at one of the interior columns in the panel tested. Deflections were measured at the center of the panel by means of a lever arm bearing against the bottom of the slab at one end and moving against an upright post at the

FLOOR-SLAB DEFLECTIONS
MINNEAPOLIS ARMORY (IN.)

Point No.	Load on 2 Hr.	Load on 72 Hr.	Load Just Removed	Immediate Recovery Per Cent	Ration Max. Defl. to Span.
1.	.0812	.0891	.0117	87	1 to 2,080
2.	.0855	.1084	.0276	75	1 " 1,720
3.	.0752	.0910	.0174	81	1 " 2,040
4.	—.0060	—.0097	.0049	50	1 " 12,500

Note: Deflections were measured by C. A. Hughes, associate professor of structural engineering, University of Minnesota. Final recovery readings could not be obtained, because workmen had disturbed the points before readings could be taken.



LOCATION OF TEST LOADS on thin flat-slab floors in two recently completed buildings.

opposite end. The deflection was magnified ten times by the lever. During the first 24 hours the slab was under load, the deflection increased to 5/100 of an inch, and then remained stationary for the 36-hour load period. The recovery of the slab after the load was removed was not reported. It will be noted that this deflection is about 1/3600 of the span.

The two slabs were designed according to the A.C.I. code, 2,500-lb. concrete being used for the armory and 2,000 lb. concrete for the hospital building.

A load test was also made on the concrete-joist construction in the second floor under the balcony of the Minneapolis Armory. The slab has a clear span between girders of 20 ft. 1 in. The joists are 5 in. wide by 8 in. deep, spaced 25 in. on centers. The total depth of the slab is 10½ in. The slab is continuous on one end and cantilevered about 4½ ft. on the other end. Both the continuous and cantilever ends of the joists were loaded as well as the span in which the deflection was measured. The applied load was 150 lb. per sq.ft., or twice the design load. The total deflection at the middle of the span was 0.225 in., or 1/1070 of the span. About 0.088 in. of the deflection occurred in the girders. The immediate recovery was 69 per cent, and the recovery 67 hours after the load had been removed was 75 per cent.

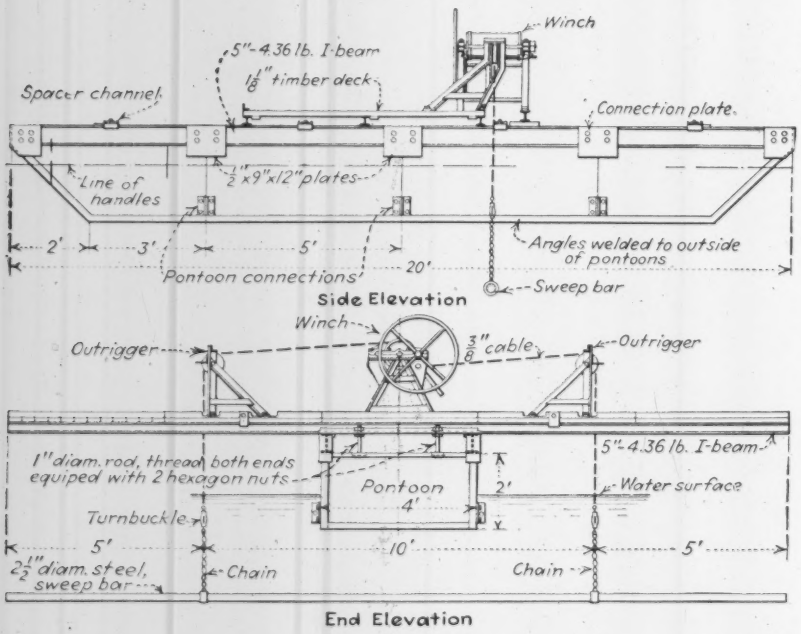
Sweep-Float Made Portable Through Use of Aluminum Alloy

By Vernon H. Donaldson
Junior Engineer, U. S. Engineer Office, Buffalo, N. Y.

LOW-WATER CONDITIONS in the Great Lakes basin during the past two years have made it imperative that detailed investigations be made quickly and frequently to determine controlling depths in the affected harbors and channels. Such checking can best be done with a sweep-float, but sweep-floats as built heretofore have been too heavy and bulky to move from harbor to harbor except by the slow process of towing through open water. Storm delays and losses also are involved. To meet this need, a light-weight portable float was built by the U. S. Engineer Office at Buffalo, N. Y. It is made chiefly of aluminum alloy of units that can be manually handled for loading into a truck trailer for transportation overland.

To obtain the light weight, aluminum alloy was used in all sections of the float below the deck line, the deck itself being of wood. The hand winches, outriggers and sweep bars are of steel and are the only steel in the float. The sweep bars are the heaviest single pieces, weighing 350 lb. each.

DETAILS OF ONE PONTOON ASSEMBLY for the portable sweep-float. All of the structure below the deck is made of aluminum alloy.



Two rectangular section pontoons were built of aluminum-alloy plate, each pontoon being made up of four water-tight athwart-ship sections; the two end sections are cut back at an angle of 45 deg. with the top at the outer end. Each section has a 6-in. diameter hole in the top to permit pumping ballast in or out. The hole is closed by a countersunk special pipe plug.

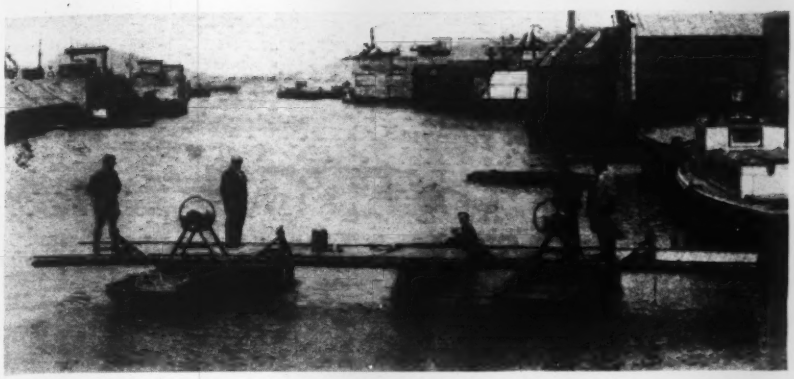
The sections are fastened together by clip angles on each side near the bottom and by I-beams laid along the top corners on each side, as shown in the accompanying drawing. Plates are welded to the side of the I-beam at each joint of the pontoon sections and project down from the beam for a distance of 4 in. Plates are also welded to each end of the beam, extending around the end and fitted to the angle of the ends of the pontoons. In the top of each pontoon section the deck plates are reinforced by angles and steel blocks in which two holes are drilled and tapped for stud bolts; channels are drilled to fit over these bolts, each end of the channel resting on the I-beams and having lugs that fit on each side of flange. These channels are pulled up tight by taking up the nuts on the stud bolts. Thus the pontoon sections are held firmly against the I-beams and cannot drop out because of wave action.

Across each pontoon assembly are laid three 20-ft. aluminum alloy I-beams as deck stringers. Each stringer has two special connections riveted to it that are bolted to the pontoon I-beams. These two pontoon assemblies are joined together by strap connections at the ends of the stringers and are so braced that the thrust of the pushing boat is transferred to all three stringers.

The deck is 6 ft. 3 in. wide and is built in sections, each 4 ft. long. It is made of 1¼-in. lumber, the boards being held in position by aluminum angles clamped to the stringers. The winches and outriggers are fastened to large bolts welded to plates, which are underneath the deck and bolted to it, the large bolts protruding above the deck.

The winches are built with a drum 8 in. in diameter to contain 80 ft. of ⅜-in. cable in a single layer. Wheels are used as a safety measure, in place of cranks, to raise the sweep bar. A brake drum is attached to the winch, which enables the bar to be dropped slowly and stopped at the desired depth. A dog in the gear teeth holds the bar in position. The outriggers overhang the front of the deck about 6 in. and are placed 5 ft. each side of the winch, so that the sweep bars are supported at the quarter points.

The sweep bars are 2½-in. round steel, 20 ft. long and hang horizontally and can be suspended at any depth under water from 3 to 32 ft. Turnbuckles between the bar and the cable facilitate adjusting the level of the bar. Adjacent ends of the bars are covered with rubber pads, to deaden the sound of bumping



PORTABLE SWEEP-FLOAT for quick checking of depths in navigable channels. Built chiefly of aluminum in small units, the apparatus can be taken apart manually and loaded on a truck for movement from port to port.

When taken down for shipment the sweep float is packed in a trailer body with inside dimensions of 20x7½x6 ft. The sides of the trailer are braced across the top by angles, and a 16-ft. boat is slung close up under these.

Power for the sweep boat is furnished by a 23-hp. outboard motor with a reversible-pitch propellor. This gives the maneuverability of a motor boat without the weight. The bow of the boat is set in a bumper block at the midpoint of the sweep, and two bridle lines are run from the stern of the boat to the ends of the sweep. The float is pushed ahead of the boat and is handled better this way than it could be by towing.

The whole float weighs but 2.8 tons and is 40 ft. long. Four men can handle any piece of it. It was unloaded and completely assembled in four hours on the first trial. The fact that it can be transported by truck eliminates towing costs, saves time lost due to rough seas, and does away with the danger of loss due to storm. It is very successful in locating obstructions and can sweep a large area in one day's operation.

The sweep-float was designed under the direction of Col. J. A. O'Connor, district engineer, by A. J. Hawkins, inspector, and the author. The cost, including truck, trailer and outboard motor, was less than $5,000.

Activated Sludge Plant Replaces Sprinkling Filter at Columbus, Ohio

THE NEW 15-m.g.d., activated-sludge-type, sewage-treatment plant for Columbus, Ohio, estimated to cost $3,400,000, is now approximately half completed and will be in operation early in 1937. Financed by a bond issue, authorization for which was voted in November, 1933, and supplemented with a PWA loan and grant, the new plant will replace the present overloaded Imhoff tank and sprinkling-filter installation built in 1908. An intercepting sewer 9 ft. in diameter at the lower end and about 10 miles in length, is rapidly nearing completion, and about $6,000,000 (exclusive of the treatment plant) is being spent for improved sewerage facilities in the city.

A number of unusual features, marking advanced design in sewage-treatment plants, are incorporated in the major units. The plant comprises grit chambers, presettling, aeration and final sedimentation tanks, sludge digestion and vacuum filtration processes. The incoming sewage first passes through two mechanically cleaned bar screens before entering four grit chambers from the surface of which grease is skimmed. Deposited grit is removed by a bucket-type elevator which empties into a hopper, where water under pressure agitates the material for flotation of organic matter. The washed grit is continuously removed from the washing hopper by an inclined spiral conveyor.

Tank design and equipment

The four presettling tanks, equipped with straight-line sludge scrapers and scum removers, are covered with a concrete roof, and foul air is exhausted from this covered structure by the aeration tank blowers. The contract for this work will amount to about $267,000.

From these tanks the partly clarified sewage is conducted to a group of eight double-pass aeration tanks fitted longitudinally with filtros plates for diffused-air spiral rotation. Instead of baffles across the width of the tank, an occasional bank of filtros plates has been installed normal to the flow to provide an air wall for the promotion of mixing. Flexibility of operation, to insure the greatest efficiency in the use of air, is provided by the extension of the cast-iron influent and return-sludge pipe about one-third the length of each tank, and valves and gates in these pipes permit the operator to introduce raw sewage and return activated-sludge at various points in order to determine the optimum point of application. Control of each tank will be maintained by a valve and meter panel, similar to those used in water-filtration plants, on which recording meters will present a visual record of the solids content, volume of return sludge, sewage flow and air consumption. The aeration basins have been constructed as floating units on natural hard-packed gravel foundations. In order to prevent the tanks from being moved by outside water pressure, flap valves opening inward have been inserted along the sides of the tanks near the bottom, so designed as to relieve any outside hydrostatic pressure tending to lift the tanks. Contracts for the aeration units and pipe galleries are about 80 per cent completed and were let for a total of $859,000.

The final settling units, four groups of two tanks, equipped with longitudinal scrapers for sludge removal, are unusual in that peripheral effluent weirs are not used. In their place, four surface skimming weirs, two with the flow and two at right angles but interconnected at the junction points, have been provided to give a total overflow length of 600 ft. per tank. The weirs are concrete open-box channels with V-notched metal plates, supported by columns raising from the tank bottoms between which the scrapers operate. These tanks will cost $294,000 and are now 75 per cent complete.

Excess activated sludge will be pumped to concentration tanks, and the supernatant will be decanted before it is mixed with the primary sludge for digestion in eight 70-ft. concrete digestion tanks, designs for which are now being made.

A temporary installation has been made for the four 300-sq.ft. sludge filters, and they are being operated to dewater Imhoff sludge conditioned with approximately 3 per cent ferric chloride and about 8 per cent lime, dry basis. Provision has been made for chlorination of the plant effluent before it is discharged into the Scioto River.

The Columbus project is under the general direction of P. W. Maetzel, chief engineer of the division of engineering and construction; R. A. Allton, sewage-disposal engineer, is in charge of design and construction of the treatment plant, and O. Bonney, sewerage relief engineer, has charge of sewer design and construction. John H. Gregory, professor of civil and sanitary engineering, Johns Hopkins University, Baltimore, Md., is consulting engineer.

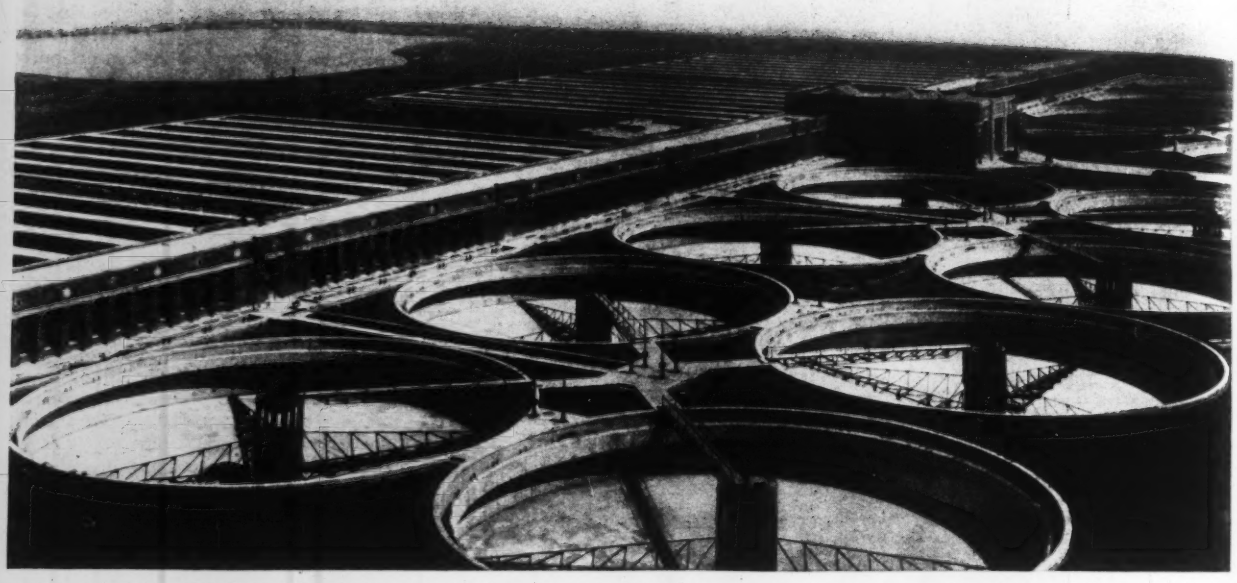


FIG. 1—AERATION UNIT and final settling tanks at Cleveland's new lakeside plant, between which is the operating gallery flanked on each side by the influent and effluent channels. The return-sludge-pump building in the right center is midway from the ends of the 1,000-ft. gallery.

Cleveland Adds a New Plant to Its Sewage-Disposal Facilities

- Comprehensive planning directed toward the abatement of pollution in Lake Erie has resulted in successive additions to the city's sewage-disposal facilities, the latest of which is the 123-m.g.d. activated-sludge plant now under construction in the Easterly District.
- Combining beauty in layout with utility, the new plant incorporates many original features, among which are grease separators and a novel arrangement of the sludge-digestion units located 13 miles from the plant site.

CLEVELAND'S new Easterly sewage-treatment works, which will be placed in operation early in 1937, represents a major development in the carefully conceived program initiated many years ago for the protection of water supply and bathing facilities, through the abatement of pollution in Lake Erie. Metropolitan Cleveland borders on more than 30 miles of lake shore, and like other cities on the Great Lakes uses this huge inland sea in the dual rôle of a source of water supply and as a discharging basin for liquid-carried waste. To integrate these diverse functions so as to strike a proper balance has been the subject of several engineering investigations which led to the adoption, in 1912, of a comprehensive plan and program of sewage collection and treatment. The effectiveness of this long-range plan, exemplified by the substantial accomplishment made in the last 24 years, following in the wake of the city's development and the requirement for additional purification facilities, is climaxed in the present construction of the 123-m.g.d. Easterly activated-sludge plant.

The past development of sewerage improvement in Cleveland is of considerable interest, since it emphasizes the importance of the work that has already been done and the need for undertaking at various times major steps in providing sewage-treatment facilities. In the early days, the problem of disposing of Cleveland's sewage was simply one of collection, and small lateral sewers were laid, to provide fairly direct outlets to the lake or to streams which at one time traversed the city. As population increased, standards of sanitation were raised and the purity of the water supply became a matter of great concern. As a result, in 1896 a commission of engineers, composed of Hering, Benzenberg and Fitzgerald, was ordered to prepare a report on the water-supply and sewage-disposal problem. It recommended a system of intercepting combined sewers to collect the sewage of the entire city and discharge it into Lake Erie through a submerged outfall at a point 10 miles east of the mouth of Cuyahoga River,

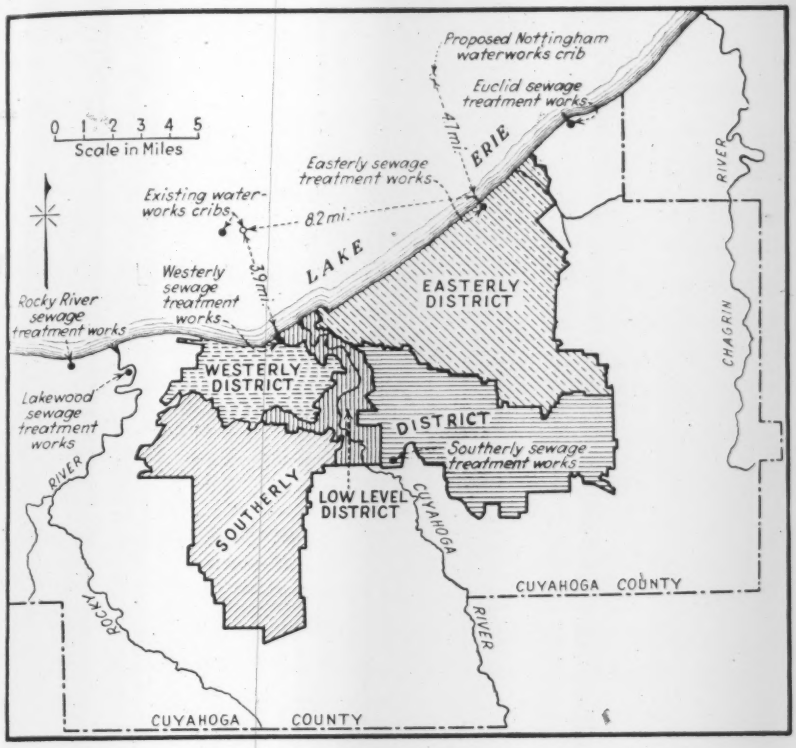


FIG. 2—SEWERAGE districts of Metropolitan Cleveland, which are served by five disposal plants along 30 miles of shoreline. The low-level zone along the Cuyahoga River is the only one of the districts having no treatment plant.

Consideration was given to the treatment of sewage, but largely because of costs no artificial method of purification was proposed. In conformity with the suggested plan, an intercepting sewer, now the principal trunk line to the Easterly plant, was constructed from the Cuyahoga River to East 140th St., on the lakefront, and this has been in continuous operation since 1905.

When the city commissioned the late R. Winthrop Pratt to study sanitation requirements in 1911, he recommended in his preliminary report that experimental and research studies be conducted before definite conclusions were drawn regarding the most economical plan for treating sewage. To this end, in the period 1912 to 1918, an expenditure of $150,000 was made in an effort to establish the accomplishments of various methods of treatment, together with their cost and application to local conditions. Particular stress was placed upon the development of a workable grit chamber, the design of sedimentation tanks, and the dewatering or drying of sewage sludge.

Fine screen tests were made, in what was the first installation in this country where a full-sized unit (Reinsch-Wurl) was operated under rigid analytical control. An experimental 1,000,000-gal. activated-sludge plant, operated for a year, starting in February, 1915, furnished the original data and conclusions that have since been proved elsewhere in actual plant installations.

From these tests and investigations were formulated the following conclusions incorporated in the Pratt report:

1. That metropolitan Cleveland should be divided into four major sewerage districts, the Westerly, Easterly, Southerly and Low Level; and that each district, excepting the Low Level, should be provided with a main intercepting sewer to deliver the sewage to appropriate treatment sites.

2. That the sewage of the Westerly and Easterly Districts should be treated at two lakefront sites, located respectively at West 58th St. and East 140th St., while the sewage from the remainder of the city should be treated at an inland site located on the Cuyahoga River opposite Willow Station.

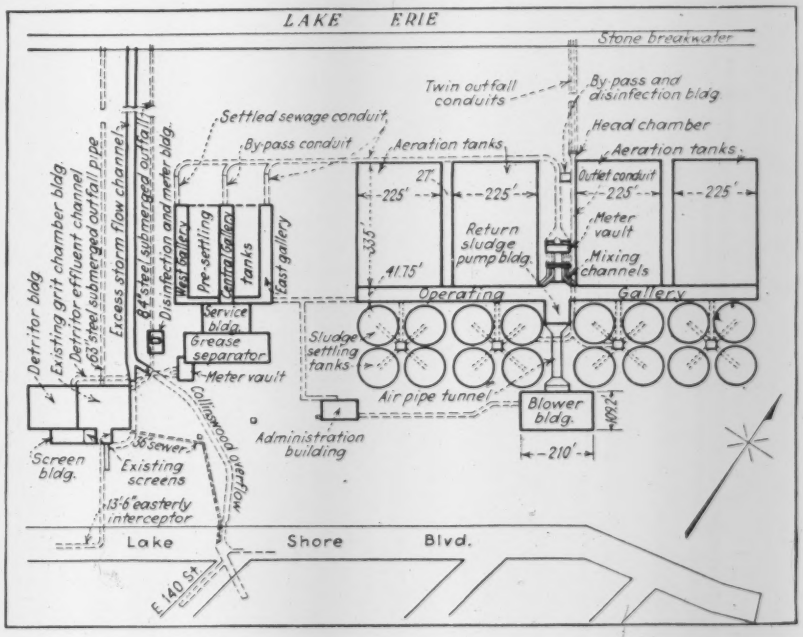
3. That partial treatment of the sewage should be provided at the lakefront sites, while complete treatment should be used at the Southerly site.

Outstanding in this modification of the original plan was the division of the area into four major sewerage districts instead of one, as formerly contemplated. This subdivision enabled the use, at no additional expense, of the excess capacity in the existing Easterly interceptor for stormwater flows in that district. Equally important was the selection of an inland site for the treatment of sewage from the Southerly District.

Accomplishments to date

The practical result of the investigational work and studies directed toward the development of a comprehensive program of sewerage and sewage treatment is recorded in the substantial accomplishments that have since materialized. Major treatment works have been constructed for the Westerly and Southerly Districts, and the new 123-m.g.d. activated-sludge-type plant for the Easterly District is rapidly reaching completion, to supplant a coarse

FIG. 3—SYMMETRICAL LAYOUT of the Easterly plant simplifies the arrangement of conduits, and permits flexibility of operation and control. The present capacity of 123 m.g.d. is planned for expansion to 160 m.g.d.



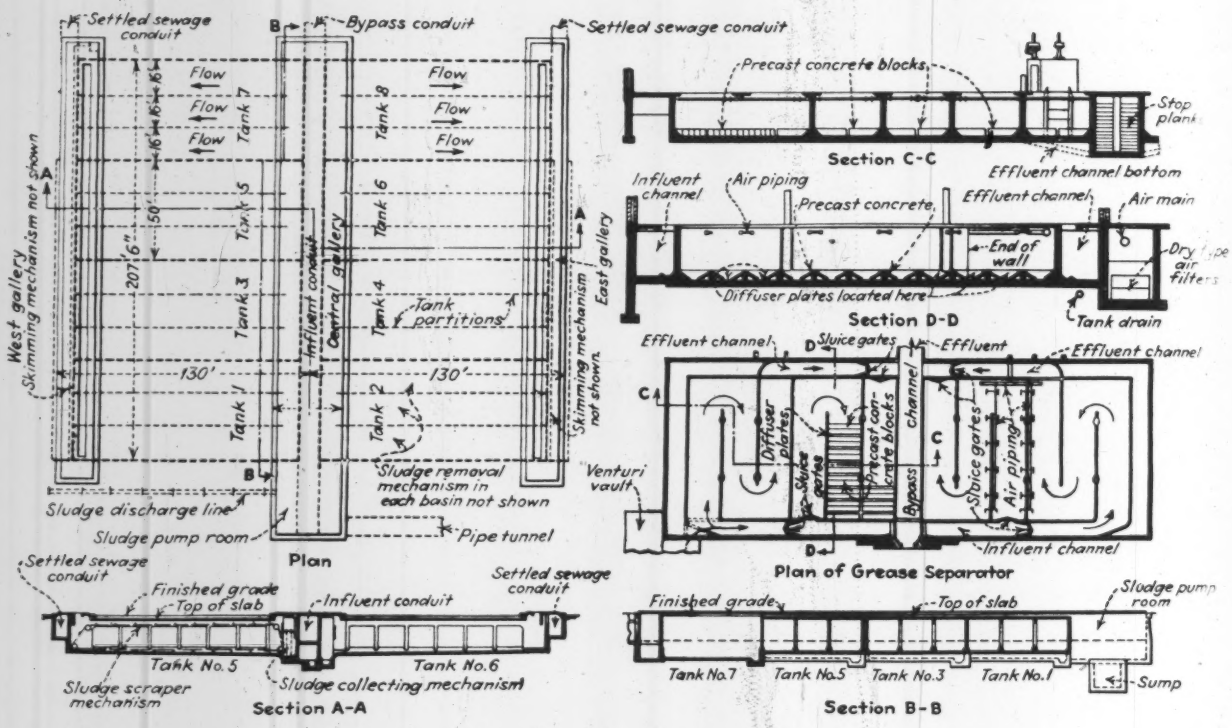


FIG. 4—PLANS of grease separation and pre-settling tanks. During 6-min. detention in the grease separators the sewage is air-agitated for the flotation of grease and oil. There are 24 straight-line sludge-scraper mechanisms in the eight pre-settling tanks.

screening and chlorination unit that has served this area for fifteen years.

The general division of metropolitan Cleveland into sewerage districts, shown in Fig. 2, consists primarily of the city itself together with a suburban border of variable width. The Euclid District includes several municipalities in Cuyahoga and Lake Counties, lying generally between Euclid Creek and the Chagrin River, and it is served by works consisting of two-story settling tanks, disinfection apparatus and a submerged outfall. Additional to the areas which are outlined upon this figure is another major sewage district in the process of being formed in the drainage basin of Rocky River. An adopted plan calls for a central plant near the mouth of the river, which will supplant the existing works at Lakewood City and Rocky River City consisting of two-story settling tanks and submerged outfalls.

With the inclusion of this last district, sewage-treatment facilities of metropolitan Cleveland are planned to afford protection to some 30 miles of lakefront, of which about 10 miles are within the Easterly District of Cleveland. Eventually all of the sewage from the Low Level area will be diverted to these major districts.

Westerly Plant: Placed in operation in 1922, the 36-m.g.d. Westerly treatment works is located on a 7-acre tract on the lakefront at the foot of West 58th St. Besides the domestic sewage from a tributary population of about 225,000, this plant treats a heavy industrial load, equivalent to an additional 100,000 persons. The present average daily flow of 27 m.g.d. passes through coarse screens, hopper-bottomed grit chambers and Imhoff tanks that remove 35 per cent of the total suspended solids with a detention period of 100 min. The settled sewage, chlorinated only during the bathing season, is discharged one-half mile offshore in 30 ft. of water. Digested sludge is also discharged into the lake.

Special demonstration units that have been installed and may soon be incorporated as permanent improvements include: a mechanically-raked bar screen and macerator for the screenings, oil and grease catchers, and vacuum sludge filters. Separate sludge-digestion tanks with gas-collection equipment have just been installed, which represent on a small scale the novel design selected for the Easterly plant.

Southerly Plant: Located about 7 miles from the lakefront on the Cuyahoga River, Cleveland's only inland plant was placed in operation in July, 1928. Complete treatment is provided by means of Imhoff tanks and trickling filters to a daily sewage flow of 20 m.g.d. from the Southerly District. The sewage is quite strong and contains a variety of industrial wastes, the most outstanding of which are washings from a worsted mill. Bar screens and grit chambers precede a battery of twelve Imhoff tanks designed to accommodate a flow of 35 m.g.d. at a detention period of two hours. Sludge digestion and storage capacity in these tanks are equivalent to 2.24 cu.ft. per capita.

Settled sewage is oxidized in six trickling filters, each of which is one acre in extent and 10 ft. deep. Discharge of the effluent into Cuyahoga River follows a 45-min. period of final sedimentation in three mechanically cleaned tanks.

Digested sludge from the Imhoff tanks, containing that pumped back from the final settling tank, flows by gravity to an ejector, which discharges it either to covered sludge-drying beds or a lagoon. There are in regular use 32,000 sq.ft. of covered sludge beds, and with sludge of a 9 per cent solids content applied 10 in. deep, each square foot of drying area accommodates from 60 to 80 lb. of dry solids per year. In 1934 there were thirteen applications of sludge per bed.

Existing Easterly Works: On a tract of land partly reclaimed from Lake Erie, along Lake Shore Boulevard near the foot of East 140th St., coarse screening and grit removal have been used since May, 1922. Discharge of the screened effluent, chlorinated only during the bathing season, is made one-half mile offshore at a point about 8 miles east of the existing water-intake cribs and 4 miles south of the proposed Nottingham water intake.

The construction of bar screens and grit chambers of the Easterly site was originally carried out with the idea that the structures installed at that time would fit in with a more complete plant to be built at some future date. It was

felt that such a plant would demonstrate the efficiencies of certain treatment devices, particularly those for disinfection, and in conjunction with operating records from the Westerly plant would tend to show what additional degree of treatment would be required at this point.

Public approval of new plant

The Easterly District contributes at least 50 per cent of the sewage discharged from the city of Cleveland, and the need for adequate sewage treatment was reflected in the gross contamination of the frontage waters in this area. Investigations had shown that the zone of pollution was continually widening and extending farther into the lake. Appreciation of these conditions, which were not only menacing the quality of the water supply but seriously impairing recreation facilities, led to a public demand that the degree of treatment of the Easterly site be increased. This resulted in the initiation of the present major program involving the expenditure of $12,000,000 when the electorate, in November, 1930, approved a bond issue for financing sewage-disposal improvements.

George B. Gascoigne, consulting engineer, was commissioned by the city to prepare reports and make recommendations. His studies led to the conclusion that a plant of the activated-sludge type should be adopted to provide complete treatment for all the wastes in the Easterly District at a site adjoining the existing screening plant at E. 140th St. Limited area and the residential development at this location led to the decision that it was advisable to pump all sludge to the Southerly Plant, 13 miles distant, for digestion and disposal.

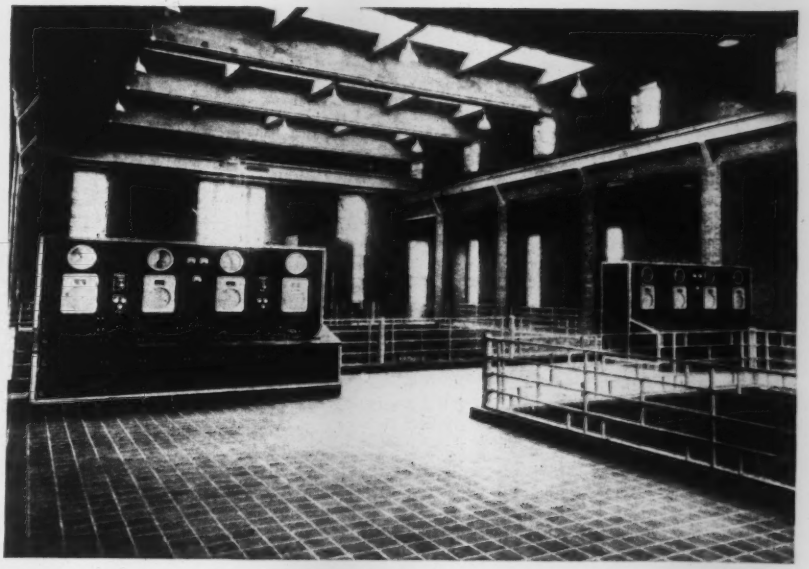
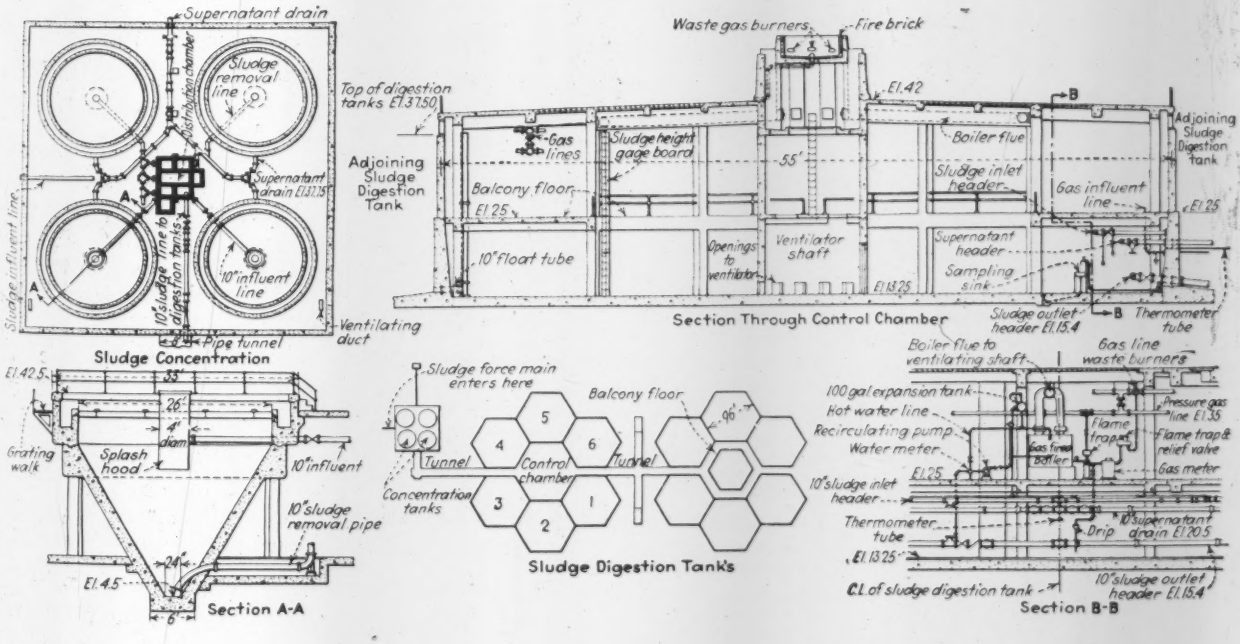


FIG. 5—BENCH-TYPE METER and control panels in the return-sludge building provide readings of excess and return sludge, so that the ratio of these two factors can be maintained as desired.

The Easterly plant design calls for a present capacity to serve 770,000 persons who contribute an average sewage flow of 160 gal. per capita daily, and it is planned that future expansion will provide treatment facilities for an ultimate load of 1,000,000 population.

FIG. 6—HEXAGON digestion tanks, arranged in clusters to form a central control chamber, are fed from four Dortmund-shaped concentration tanks placed at the end of the 13-mile sludge line in the Southerly plant.

The cumulative effect of many years of sewer construction in the Easterly district has been the creation of a major point of discharge from marginal and trunk sewers in the lake at East 140th St. This presented a logical site for the treatment of sewage, but the land available was restricted in size and adjacent to a well-developed high-grade residential zone. For these reasons, and in advance of substantial expenditures for major works, the practicability of abandoning the area in favor of some other location was considered. The requirements of a site that might



be substituted were: an area not less than 100 acres, isolation from residential properties, economically situated in respect to all phases of collection and disposal of the effluent. This latter feature practically demanded a location adjacent to Lake Erie because an inland plant would necessitate, first, diverting the sewage to the site and then returning the effluent to the lake. Since no suitable place, along or close to the lakefront, was available, the East 140th St. site was adopted. Although it is only large enough to accommodate the treatment processes for the liquid portion of the sewage, it was found feasible and economical to pump the sludge 13 miles to the Southerly plant, where 50 acres of land were available for digestion structures.

Characteristics of Site: The site at East 140th St. was owned by the city and comprises approximately 45 acres between the lake and the Lake Shore Boulevard, with a frontage of 1,700 ft. on the latter. Foundation conditions are good, the prevailing soil consisting of clay underlaid by shale. The elevations of the discharging sewers are such that the new works were mostly built at the general beach level, which is about 20 ft. below the elevation of the surrounding ground in this vicinity. Proximity to high-class residences and exposure to the 15,000 motor vehicles that pass on the boulevard each day led to the provision of buildings and coverings to enclose preparatory treatment devices.

Determining capacity of plant

The Easterly Sewerage District is well developed and stabilized, and it is not probable that there will be any considerable extension of its physical boundaries beyond the 45 square miles that it now encompasses. Population forecasts, determined by the Pearl-Reed method and checked by other investigations, indicated that the 534,000 population of 1930 would increase to 770,000 in 1945, 850,000 in 1960, and reach 1,000,000 persons as ultimate.

The quantity of sewage for which provision was made was determined from a study of meter records of sewage flows at East 140th St. over a seven-year period. These indicated that the dry-weather flow, including industrial wastes, infiltration and domestic sewage, had a daily average of 160 gal. per capita. Therefore, the flow in 1945, for which the plant was designed, will be 123 m.g.d., and the ultimate future flow was set at 160 m.g.d.

The sewage to be treated may be regarded as of moderate strength. Its principal characteristics are:

	P.P.M.
Total solids	770
Suspended solids	200
Five day B.O.D.	150
Chlorine	70
Iron	20
Free ammonia	12
Organic nitrogen	8

The basic studies and design for the plant were predicated on the assumption that it was not economic to incur idle investments by providing capacity for any long futurity. On the other hand, it was not deemed advisable to be continuously seeking funds for plant enlargement. Accordingly, capacities were determined in terms of the needs estimated for the year 1945, or sufficient for ten years after the plant was completed. This procedure was modified in certain instances: channels, buildings and space for additional machinery, for example, were designed for the ultimate requirements when expansion is made.

Degree of treatment

In the past, treatment of sewage at the lakefront plants of Cleveland has been upon the basis of removing settleable solids only, with seasonal disinfection of the partly clarified sewage. This degree of treatment provides about 35 per cent purification and is viewed as the minimum acceptable.

An evaluation of the influence of sewage from the Easterly District indicated that partial treatment would reduce by 40 per cent the total pollutional load from the city entering frontage waters, whereas complete treatment, involving oxidation of the settled sewage, would effect a 75 per cent reduction. Although sewage is the principal source of lake-water degradation, there are other sources of pollution emanating from riparian industry, storm wash and passing vessels. Viewed from this angle, it was considered advisable to regard sewage treatment of high degree as necessary to offset any residual and uncontrolled pollution. From the standpoint of health protection, which is jeopardized by the use of polluted lake water as a source of water supply and for bathing, there was a definite need for complete treatment.

Recognizing the additional advantages offered by effectively treating the sewage and appreciating that partial treatment, costing $7,000,000, would afford only the absolute minimum degree of purification without safeguarding adequate health standards, it was concluded that complete treatment employing oxidation would be employed.

Selection of the activated-sludge type of plant, as best meeting the requirements for complete treatment of the Easterly District, was based on its thorough establishment with a good history of satisfactory performance and its applicability to the particular sewage of this area as shown from tests conducted in the demonstration plant operated in 1915-1918. In addition, the process was regarded as stabilized to the point where future developments were not likely to imperil major investments.

The magnitude of the project and its importance restricted consideration to proved treatment processes only, and although the trickling-filter type of installation was considered as an alternative to the activated-sludge plant, the limitations of area on the site available precluded its use.

Separate sludge-digestion and heated tanks, equipped for the recovery of gas and preceded by concentration tanks, were adopted for the treatment of the solids which, after digestion, may be dewatered on covered sand beds, or else by filtration and possibly incineration. Study was given to the manufacture of fertilizer from sludge as an alternative to digestion, but the idea was abandoned because of the present relatively poor revenue return. It was felt unwise for the city to launch upon a program which involved continuous disposal of a low-grade fertilizer, the quantity of which would approximate 30,000 tons a year, at least, until a good market demand existed.

General layout

Sewage reaches the plant site through the 13-ft. 6-in. Easterly interceptor and the Collinswood trunk system, which comprises three separate sewers, with diameters of 6 ft. 3 in., 6 ft. 6 in., and 9 ft., respectively. These sewers have a total capacity of 1,055 m.g.d., but storm-flows in excess of 390 m.g.d. will be bypassed into the lake. Coarse screens, detritors and grit chambers will treat up to 390 m.g.d.; grease catchers and pre-settling tanks up to 307 m.g.d.. The remaining units in the plant are designed on the basis of a daily flow of 123 m.g.d. Past records show that the storm overflows are in use less than 6 per cent of the time.

The effluent from the detritors enters an air-agitated oil and grease flotation unit, from which it passes to eight rectangular pre-settling tanks. From here the partly clarified sewage is conducted to a group of 32 aeration basins for a five-hour aeration period before entering the final battery of sixteen sludge-settling tanks. Between the aeration and final settling tanks is an operating gallery, 1,000 ft. in length and 19 ft. wide, which houses meters, valves, air conduits, sludge-return pumps, and distribution piping for the control of both units. Other prominent structures on the site include the administration, service and blower buildings. The outfall sewer is a twin conduit of concrete pipe supported on wood-pile bents and extending 700 ft. into the lake for discharge just beyond a new rock breakwater. Each pipe is 9 ft. in diameter with walls 9 in. thick.

Sludge digestion and drying facilities located at the Southerly plant include four concentration tanks preceding twelve digestion units to be followed by dewatering facilities.

Provision is made to apply chlorine at three points, for odor control if

necessary, and to the final effluent for disinfection during the bathing season.

Preliminary treatment

Screens and Grit Chambers: Sewage flows up to 390 m.g.d. will enter a screen building where part goes through a bar screen with 1½-in. openings and part passes to four comminutors. Each of the comminutors is placed in an individual flow channel where it will grind coarse material into small-sized settleable solids and serve one mechanically cleaned detritor. The four detritors are 36 ft. square and 3 ft. 6 in. deep. Deposited grit is continuously removed by a revolving scraper and a reciprocating upward - sloping rake elevator, which washes the grit free of adhering organic matter. Existing coarse screens and hopper-bottomed grit chambers on the plant site will be used only during storm periods when the sewage flow exceeds 184 m.g.d.

An industrial railway serves all the detritor and grit tanks, and the material recovered will be used to fill the low area behind the new breakwater. Grit removal, estimated from past records, will amount to approximately 0.08 cu.yd. per m.g. of sewage.

The detritor effluent may be bypassed into the lake but in normal plant operation it will go through two venturi meters before entering the treatment unit for air-agitated grease flotation.

Grease Separator: The grease separator is a series of horizontal baffled around-the-end flow type of tanks equipped with diffuser plates through which air is bubbled for the flotation of grease and oil. There are twelve tanks, 15 ft. wide, 65 ft. long and 6 ft. deep, and three single-pass tanks constitute one unit. As shown in Fig. 3, the sewage enters every third tank through a 5x7 sluice gate leading from the influent channel placed along one side of the tank assembly, and after completing its flow through three tanks it passes into the effluent channel that leads to the pre-settling unit. Here the scum and grease will come to the surface and be concentrated at one end by the surface flights on the sludge-removing conveyor; a cross-conveyor will skim this material for discharge into the sludge well.

Detention of sewage in the grease flocculator will be 6 min., and approximately 0.025 cu.ft. of air will be diffused per gallon. Diffusion of the air is made through rows of porous plates located between precast concrete block sections placed at right angles to the direction of flow. Details of the complete layout are shown in Fig. 3.

Presettling Tank: The primary sedimentation unit of the plant, below ground and completely covered, comprises eight single-pass tanks, each 50 ft. in width and 113 ft. long, grouped in two rows of four tanks each. The tanks are individually gated, and they may easily be placed in or out of operation to afford a detention period of 60 min. for average flow and 24 min. for maximum flow. There are three parallel galleries placed at right angles to the direction of flow in the tanks; the galleries at the outside ends are used for the effluent conduits and scum-collecting channels, while a central gallery between the two rows of tanks houses the influent conduit and sludge-collecting mechanism. At one end of this center gallery is an underground pump building and sump in which all the sludge from the plant will be collected for pumping to the concentration and digestion tanks 13 miles away.

Each 50-ft.-wide settling tank is divided by open partition walls into three basins for the accommodation of 16-ft.-wide straight-line sludge-removal mechanisms installed parallel to each other. Sludge is scraped to the influent end of the tank, where it drops into a channel that is cleaned by a straight-line sludge collector serving each tank.

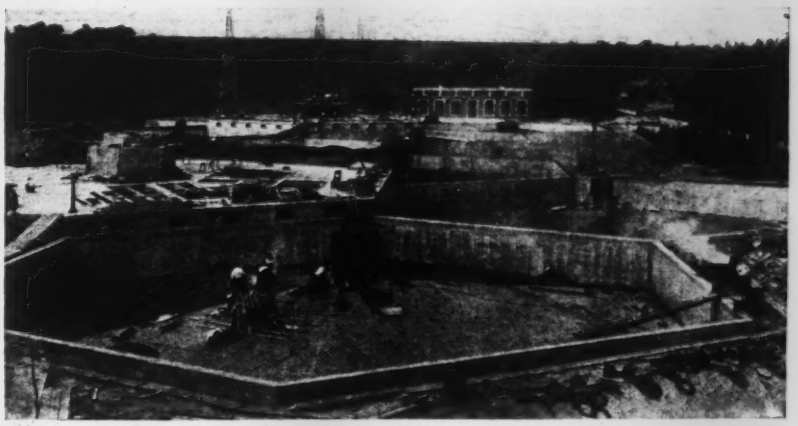


FIG. 7—SLUDGE-TREATMENT FACILITIES at the Southerly plant comprise concentration tanks, housed in the building in the background, and two clusters of heated digestion tanks with floating covers. Each group of tanks surrounds a central control chamber surmounted by a ventilator, one of which is visible in the left center.

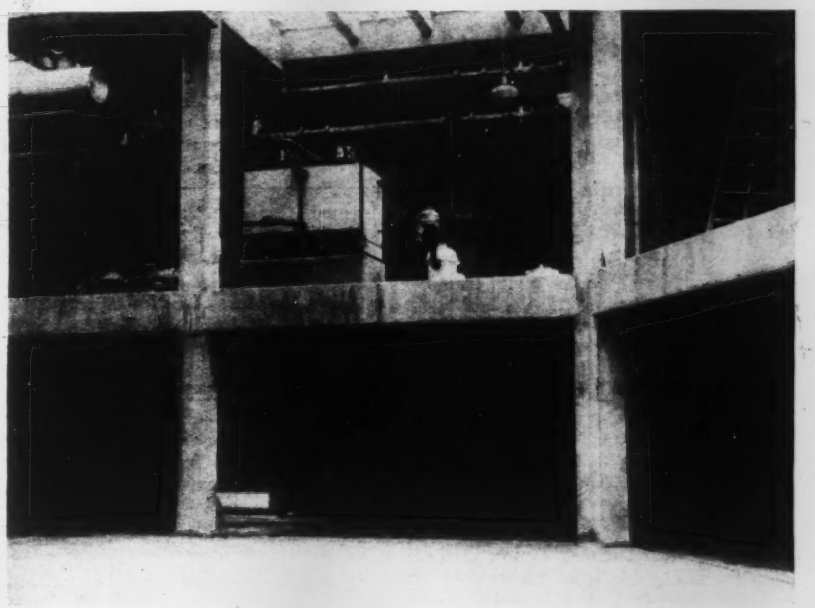


FIG. 8—INTERIOR of the hexagon sludge-control chamber, showing a complete operating unit for one of the six digestion tanks. On the balcony are a gas-fired boiler, meter and a hot-water recirculating pump; beneath are the valves and piping.

Aeration tanks

The aeration unit is divided into four batteries. A battery is comprised of eight single-pass tanks each 334 ft. long, 27 ft. wide and 15 ft. deep, equipped with a double row of air-diffusion plates. As shown in Fig. 2, there are two batteries located on each side of a 10-ft.-wide conduit. Settled sewage is brought through this conduit, terminating in a distribution chamber where flow is diverted through four 72-in. venturi meters, which discharge into

separate channels serving one battery of tanks. Return activated sludge, added to the sewage as it leaves the meters, is intimately mixed by the turbulence created in the aerated influent channel. Mixed sewage and sludge enters alternate aeration tanks through 4x4-ft. sluice gates. It flows 334 ft. to the end of the tank, where it passes through an 8x8-ft. port into an adjoining basin to make a return passage of equivalent length before flowing over the effluent weir. Compressed air, supplied through the diffusion plates, imparts a spiral flow to the liquid during the five hours of aeration acquired in traveling the length of two tanks.

To meet the requirements for air, estimated to be 1 cu.ft. per gallon of sewage treated, five electrically driven centrifugal blowers with a total capacity of 170,000 cu.ft. per minute, have been installed. The air intakes of the blowers are equipped with silencers and venturi meters. All the blowers discharge into a common header, from which distribution is made through two 60-in. pipe lines. Air for each pair of tanks is measured through 20-in. venturi tubes.

Sludge-settling tanks

For clarification of the activated-sludge mixture leaving the aeration basins, there have been installed sixteen circular settling tanks equipped with the revolving type of sludge scrapers. These tanks, 112 ft. in diameter and 12 ft. deep, provide a detention period of 2.2 hours at average flow and a settlement rate equivalent to 850 gal. per sq.ft. per day.

Each group of four sedimentation tanks is served by a distribution chamber connected with an aerated main channel that collects the effluent from all of the aeration tanks. The chamber, located equidistant from the center of each tank, is provided with sluice gates for the control of flow. Clarified liquid will be disinfected with chlorine in the outfall chamber just before it is diverted into the twin conduits that discharge into the lake.

Settled activated sludge is drawn from the final settling tanks into the return-sludge building, where six 15-m.g.d. capacity pumps are installed. One pump is connected to each group of four tanks, and there are two stand-by units in case of breakdown. Approximately 25 per cent of the sludge is returned to the sludge-control chambers, from which it flows to the mixing channels, where it joins the incoming sewage as previously described. Excess sludge is drawn off through four 8-in. pipes leading to a collecting sump, where it is mixed with the sludge from the presettling tanks before being pumped to the digestion plant.

An ingenious and practical arrangement for convenient operation and control has been incorporated in the design of the sludge-digestion structures. The essential elements of the scheme are preconcentration tanks connected by a tunnel with two digestion units that are clustered around a central control chamber. In these chambers are housed the six sets of individual hot-water boilers, meters, piping and control appurtenances for each group of tanks.

Primary and excess activated sludge, with an estimated average moisture content of 97 per cent, will be pumped for a distance of 13 miles to the Southerly plant site. Tests have shown that the liquid sludge has a friction coefficient no greater than that of water. The total elevation to be overcome will be 225 ft., and the pumping pressure will be supplied to two pumps at the lakefront plant. The estimated sludge volume will be 650,000 gal. per day in 1937 and 770,000 gal. per day in 1945.

When the sludge reaches the plant, it first enters the preconcentration building, which houses four Dortmund-shaped settling tanks. The size of the latter is sufficient to provide one hour's detention during which the sludge may compact to an average moisture content of 96 per cent before it flows to the digestion tanks. Supernatant liquor, overflowing a peripheral weir, is drained to the adjacent Southerly treatment works for disposal.

The twelve hexagonal-shaped digestion tanks, with a total capacity based on a 2.75-cu.ft. allowance per capita, are grouped in two clusters of six tanks each. This arrangement, using hexagon shapes, made possible the formation of an interior covered chamber in which one wall from each tank serves as a side. Access to the two chambers thus constructed is gained through a service tunnel carrying various pipe lines.

In the central chamber is housed all the equipment necessary for the operation and control of digestion in each tank. Sludge, supernatant and gas line valves and piping, sampling sticks, thermometer tubes and gage boards are placed on the first floor. On a balcony floor, carried out 22 ft. 6 in. from the sides of the chamber and extending completely around the periphery, are located six sets of gas burners, flame traps, meters and circulating hot-water pumps; each set is so placed that it adjoins the digestion tank it serves. A forced-draft ventilating system, installed in a 14-ft. square shaft in the center of the room, keeps the chamber free of noxious gases. Surmounting the small tower over the ventilating shaft is a waste gas burner for disposing of excess gas.

Status and direction

During the last four years steady progress has been made on construction of the Easterly plant, and more than $9,000,000 worth of work, representing better than 75 per cent of the project, is either completed or under contract. The pre-settling, aeration and sludge-settling tanks are completed, while the sludge-digester tanks, blower building with equipment, grease separators, service and administration buildings are under construction. The preparatory treatment devices, including comminutors, detritors and appurtenant buildings, and the 12-in. force main are under contract for completion before the end of 1936.

George B. Gascoigne is consulting sanitary engineer for the entire project, which is being carried out under the direction of Frank O. Wallene, director of public service, and Robert Hoffman, consulting engineer and commissioner of the city of Cleveland.

Engineering and Science Symbols to Be Compiled

A COMPILATION of letter symbols and abbreviations in use by engineers and scientists is to be undertaken by the Committee on Symbols and Abbreviations of the American Standards Association.

Coinage of new words and terms and the adoption of many foreign words and phrases in engineering and the sciences have given rise to demands for a new compilation of standard usage, according to the committee, which has been reorganized to coordinate existing abbreviations and symbols, and for rewriting the present standards into a comprehensive manual of letter symbols and abbreviations.

Twelve standards for letter symbols, abbreviations, and graphical symbols have been developed by the technical committee of the American Standards Association, and in order to simplify its work the committee has been divided into two parts, one covering the letter symbols and abbreviations, and the second covering the graphical symbols. Twelve subcommittees have been set up covering letter symbols and abbreviations for the following subjects: mathematics, physics and mechanics, structural analysis, hydraulics, heat and thermodynamics, photometry and illumination, aeronautics, electric and magnetic quantities, radio, scientific and engineering terms, astronomy and surveying, and geodesy.

The committee to prepare standards on graphical symbols will start its work soon. The standards already approved by the American Standards Association are being studied by the committee for possible revision. These subjects include a number of those mentioned above.

Limited Effect on Water Supplies Expected from Florida Canal

Board of engineers and geologists finds that the deep cut for the ship canal now under construction across Florida will have only local effect on underground water resources of the state

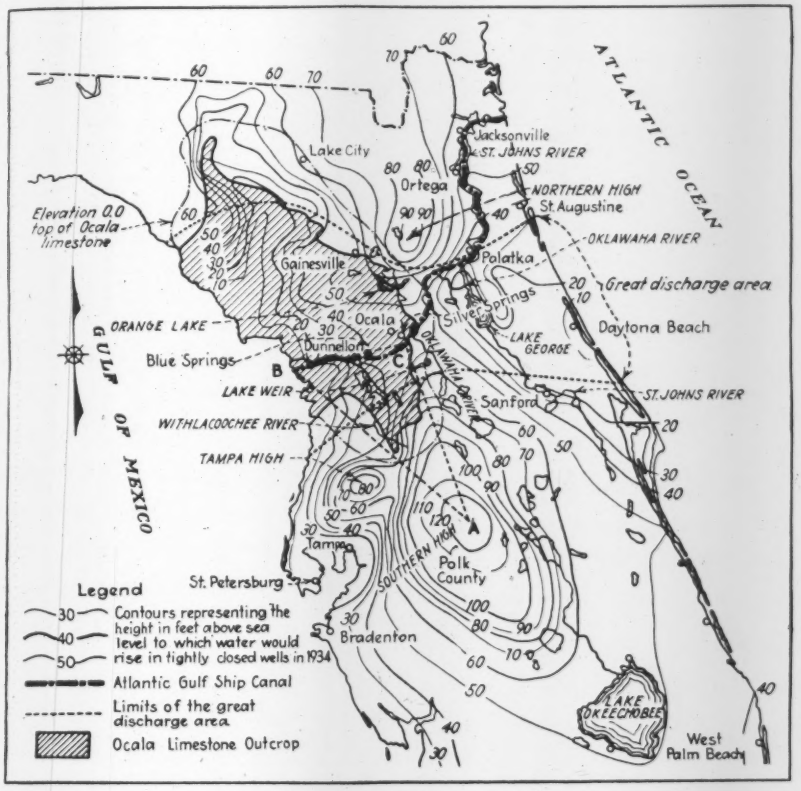


FIG. 1—THE PROPOSED SHIP CANAL across Florida cuts through the plateau between the high points of underground pressure and in a region where excess water is discharged from the underground reservoir. The contour-like lines shown indicate zones of equal piezometric pressure in the Ocala limestone.

A PRELIMINARY STUDY of the available data relating to the underground water resources of the Florida peninsula indicates that a cut across the northern part of the peninsula along the line laid out for the Atlantic-Gulf ship canal will have no extensive effect upon the water supplies of the state, according to the findings of a board of geologists and engineers appointed by Major Brehon Somervell, district engineer, U. S. Army, at Ocala, Fla. The board reserves judgment on several local water-supply questions until it has had an opportunity to make a more complete study of underground conditions. Its present report, therefore, is considered a preliminary one, but the board does not expect that its major conclusions will be affected by the exploratory work now in progress. An allotment of $20,000 recently was made for this purpose from the emergency-relief funds set aside for the canal construction.

The board consisted of Clarence E. Boesch and Frank C. Carey, civilian engineers, U. S. Army; Sidney Paige and E. B. Burwell, government geologists; and Malcolm Pirnie, consulting engineer, New York. It was appointed to look into the question of the possible effect of the canal upon the water supply of Florida because of the protest from cities in the southern part of Florida against construction of the canal for fear it would have a detrimental effect upon their water supplies, practically all cities in Florida taking their water from underground supplies believed to originate chiefly in the higher lands in northern Florida through which the canal is to be cut.

The following is an abstract of the board's preliminary report.

The Florida peninsula is about 375x 140 miles in size and no part is more than 330 ft. above sea level. The annual average rainfall is 52 in. Surface drainage patterns of the peninsula are governed in large measure by two topographic highs, one 75 miles south and the other 40 miles north of the canal route. The canal will cross the peninsula where drainage systems from the north and south meet and diverge to the east and west to empty into the Gulf of Mexico and the Atlantic Ocean.

The peninsula is underlain by gently arched sedimentary strata consisting of a lower series, largely porous limestone, overlain by an upper series of less porous sand, clay, marls and sandy limestone. The upper series has been removed by erosion from an oval area 120 miles long by 50 miles wide on the northwestern side of the peninsula surrounding the crest of the structural arch, and in this region the Ocala and Tampa limestones are exposed at the surface. The canal route traverses the southern part of this area as shown on the accompanying map.

Much of the rain falling on the peninsula builds up an immense underground fresh-water reservoir within both the upper and lower series of rocks. The fresh water floats on the sea water, which permeates the rock at the lower levels and is depressed below sea level to depths depending on the height of the water table above sea level. For every foot of fresh-water head above sea level, the salt water is depressed 38 ft. below sea level. At lower elevations where the upper series of relatively impervious strata are sufficiently thick, artesian conditions are set up; and in places the fresh-water reservoir, especially the water contained in the Ocala limestone, extends far out to sea.

The flow of water within the underground reservoir is largely activated by two piezometric highs corresponding closely to the two topographic highs. Where the canal route crosses the peninsula between these highs, it roughly parallels the path of maximum subterrannean discharge from the reservoir system. Of the 195 miles of canal from deep water to deep water, excavation along only 27 miles will have any appreciable effect on the level of the groundwater table in the open reservoir or on artesian conditions. The Ocala limestone will not be cut to the east of Silver Springs, and the artesian reservoir will not be cut at any point.

The upper series of rocks in the reservoir absorbs water but yields it with relative difficulty; the lower series absorbs water and yields water relatively freely. The two series act as a unit constituting a single great reservoir. In Fig. 1 are shown contours at 10-ft. intervals based on sea level, to indicate the piezometric surface of water in the Ocala limestone. In the area where the Ocala limestone is exposed at the surface, the contours indicate the elevation of the water table in the limestone. Over

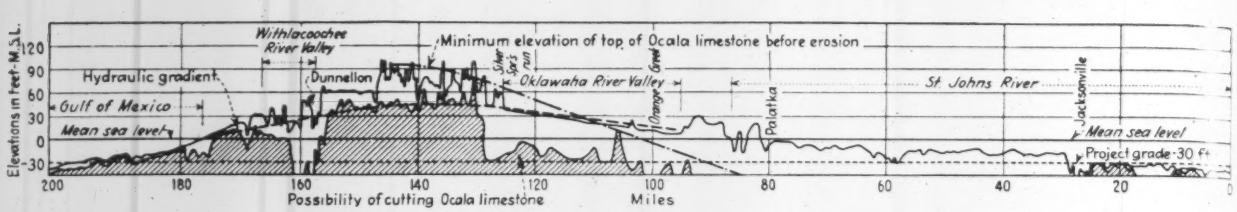


FIG. 2—THE OCALA LIMESTONE is cut only in the western part of the canal, where it is not under artesian pressure. This drawing is a profile along the center line of the proposed ship canal.

the remainder of the area the Ocala limestone lies beneath the upper series, and here the elevations indicate the elevation to which the Ocala limestone water will rise in a tightly cased well. In many places this elevation lies beneath the surface of the ground, while at others it is above the surface and results in artesian conditions. The beds of the upper series overlying the Ocala limestone also contain water but more tenaciously held. It is nevertheless true that this water exerts pressure on the water in the Ocala limestone beneath.

Surface drainage

On the western side of the peninsula the Withlacoochee River system heads against the topographic and water-table high in Polk County. This river drains into the Gulf of Mexico at the western entrance of the canal route. About the center of the peninsula is a second river-lake system, that of the Oklawaha River, headed against the same topographic and groundwater highs and draining eastward into the St. Johns River and thus to the Atlantic Ocean at the eastern entrance of the canal. The headwaters of this system are characterized by the presence of countless lakes and considerable areas of swamp that in general mark the top of the underground water table. On the east side of the peninsula is the third river system, that of the St. Johns River, draining north for 140 miles to Jacksonville.

The Withlacoochee system may be regarded as a spillway on the west side of the groundwater reservoir, the Oklawaha system as a spillway near the top of the southern dome of the reservoir, while the St. Johns system drains the eastern side of the reservoir.

The surface of the groundwater reservoir lies in the upper series of rocks along the entire length of the peninsula. Beneath this series the Ocala limestone is under artesian pressure, and along part of the zone, notably in the Lake George region and out to the sea, there is substantial leakage of artesian water to the surface.

North of the canal route there are drainage systems draining southward analogous to those on the south. These include the Blue Spring system on the west, largely subterranean but nevertheless draining the surface of the water table, the Silver Springs and Orange Lake system (in part subterranean), and the western tributaries of the St. Johns River.

It is clear that the canal, in crossing the peninsula, traverses the most important discharge areas of the Floridian plateau, roughly paralleling the directions of flow.

To lower the water table materially over the area embracing the drainage basins of the river systems enumerated, these systems must first be absorbed and essentially cease to flow. All of these drainage systems, in fact all the drainage systems of the plateau, confirm the fact that the present rainfall is sufficient to hold the groundwater table at its present position (essentially a condition of saturation) and is sufficient to support the surface runoff of the rivers and streams, and to support all sub-sea-level losses.

After the canal is excavated, and after the water table has been adjusted to the new outlet afforded by the canal, the rate of flow off the peninsula will be no greater than it has been in the past. Near the canal, however, there will be a change in the ratio between the amount which now runs off underground and the amount which now runs off on the surface, and the volume of the reservoir as a whole will be diminished a certain amount.

Conditions along the canal

The canal cuts through the porous Ocala limestone formation in the area from the Gulf of Mexico to a point southeast of Silver Springs. In this section the elevation of the water table rises from zero at the gulf to 45 ft. at the top of the drainage divide, and descends to 40 ft. near the meridian of Silver Springs, beyond which point it falls off to the east. Here the excavation will depress the top of the water table to an elevation a few feet above sea level, depending on how much fresh water runs out through the canal. Examination of the water table adjoining existing free outlets indicates that the effect of the free outlets into the canal will extend to a point between 10 and 15 miles south of the canal. Considering the triangular area shown on Fig. 1, the point *A* lies at the apex of the triangle on the summit of the southern water high (135 ft. above sea level), *B* lies at sea level, and *C* lies on the main line of the canal south of Silver Springs. The slope along the line from *A* to *B* is 1.52 ft. per mile, and the slope from *A* to *C* is less than 1.21 ft. per mile. Assuming that the level at point *C* drops the full 40 ft. to sea level, the slope becomes 1.73 ft. per mile, only 2½ in. per mile more than from *A* to *B*. After the canal is dug and the water table adjusted, the 40-ft. contour will lie south of the point *C* near Lake Weir.

Of the 195 miles of canal, the construction of only 95 miles involves excavation above sea level, and of this 37 miles cuts the Ocala limestone. Of this, only 27 miles (the section between Dunnellon and Silver Springs) is of much significance with respect to the water-table problem.

The outcrop of the Ocala limestone at the surface is shown in Fig. 1, also the location at which it dips below sea level. Along the canal route this is near the meridian of Silver Springs. Here the artesian head developed will raise water slightly above the level of the Oklawaha River valley.

Effect on water supplies

In so far as domestic water supplies for municipalities are concerned, no substantial injury will result from digging the canal. The largest city along the canal route within the area where the Ocala limestone outcrops is Ocala. At present there is not less than 1,600 ft. of fresh water beneath sea level at Ocala, and at no great distance to the north of the city there always will be an enormous supply of underground water. Today the city is drawing its water principally from a depth of about 225 ft. below sea level.

The ultimate effect of the canal on springs and lakes in the area contiguous to the canal cannot be predicted with certainty at this time. An analysis of the possible effect of those features is reserved until further extensive investigations now in progress have been made. Studies made so far lead to the belief that should the lowering of the water table encroach upon such features of intrinsic value as Silver Springs and Blue Springs, regulatory works could be constructed which would minimize, if not entirely obviate, the damages. The flow into the canal from these points of heavy discharge must in any event be controlled; therefore, any expense in-

curred in their preservation would serve a double purpose.

Although the canal cut from the Gulf to Silver Springs will traverse only the open reservoir (as distinguished from the artesian reservoir), the lowering of the water table to near sea level along the canal cut will necessarily affect the artesian head to a certain degree in the artesian basin to the east of Silver Springs. Inasmuch as the terrain is already affected by bottom-water salting at many places and inasmuch as investigatory drilling is now in progress, an opinion as to the effect of the canal cut in this area is reserved at this time.

The domestic water supplies of such cities as Jacksonville, Tampa, Palm Beach and Miami will be entirely unaffected. The city of Tampa derives its water supply from Hillsborough River; the city of Palm Beach derives its domestic water supply from rain water stored in lakes and swamps and the Quaternary sands and sandy limestones exposed at the surface of the ground. The Ocala limestone lies buried 900 ft. beneath the surface, and even if the water within it were potable, which it is not, the artesian head of such water would be unaffected by the canal cut 200 miles distant. The city of Miami is even farther to the south, 250 miles from the canal. Its water supply also is derived from the Quaternary limestone; the Ocala limestone here is buried 1,000 ft. and does not contain potable water. Local rainfall is the source of potable water in Miami as at Palm Beach. The city of Jacksonville obtains its water supplies from deep wells under artesian heads derived from the piezometric high in the terrain to the west and northwest of the city. The city is 75 miles distant from the nearest point on the canal, where the Ocala limestone will be cut, and from Lake George, where the piezometric surface is close to sea level. No change is to be expected in the head of the artesian wells at Jacksonville because of the canal cut.

The city of Sanford is 52 miles from the canal cut near Silver Springs. It obtains its artesian water entirely from the northeastern slope of the southern high and not from the area to the northwest where the Ocala limestone occurs at surface. The artesian heads are already reduced nearly to sea level in the Lake George region, northward from the city. The wells at Sanford are already affected by bottom-water salting. They cannot be affected except by a reduction of the water table in the southern high, which is not to be expected from the construction of the canal. It is not believed, therefore, that the canal will have any appreciable effect on the water supply at Sanford.

Salt-water encroachment

Observations of the U. S. Geological Survey in 1925 indicated that the excess salinity of the lower St. Johns River caused by intrusion of the sea-water wedge dies out in its upstream travel at normal tide range in the vicinity of Ortega. In addition to the fresh-water flow, the reduction in tidal impulses due to the shape of the channel reduces the tidal flow and retards the advance of the salt-water wedge. These conditions will continue after the canal is dug.

From Jacksonville to Palatka excavation of the canal will slightly increase the mean cross-section, and from Palatka to the Gulf of Mexico excavation of the canal will provide an additional channel of possibly 10 or 15 per cent additional flow capacity. Present information indicates that this additional capacity will be supplied from the discharges of the Withlacoochee River and Blue Springs. In addition, there will be a further discharge from the flow into the cut itself, which is now wasting to the Gulf of Mexico. The minor changes in flow conditions in the St. Johns River to be anticipated as a result of the canal construction will obviously have but little effect upon salt-water encroachment in the river, these conditions remaining substantially unchanged.

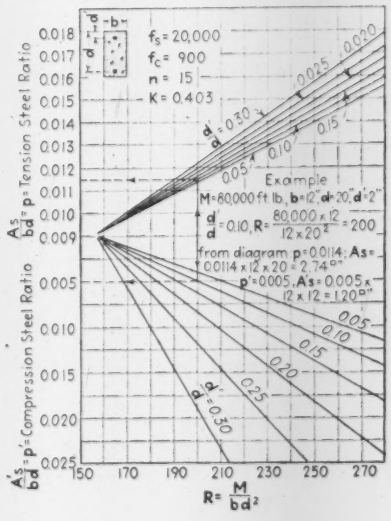
In the land cut of the canal it is believed that the fresh-water flow will be sufficient to prevent encroachment of a salt-water wedge any considerable distance back from the gulf. That such encroachment will cause any damage to water supplies, however, is unthinkable, since the conditions set up will be little different from those existing where other deep fresh-water channels of relatively low velocity enter the gulf, such as the Withlacoochee River. The excavation of the canal through the Ocala rock in the central area will create conditions somewhat comparable to those which existed in the Lake George region prior to the development of the solution passages which leak into that region, but it is not anticipated that encroachment of bottom-reservoir salt water into the canal where it cuts into the Ocala rock will occur within any conceivable period of time. This subject will, however, be studied further on the basis of additional data that are now being obtained.

Letters to the Editor

Design Diagram for Concrete Members Doubly Reinforced

Sir—In line with a rather general agreement among authorities on reinforced-concrete design to use higher working stresses than have been generally used heretofore, engineers may be interested in the accompanying diagram, which is for use in the design and, to a limited extent, in the investigation of beams and slabs reinforced for both tension and compression.

The form of the diagram was devised, I believe, by Sven G. Roeblad, of Boston, Mass., but those previously made have been based on lower stresses in steel and concrete. The diagram has the merit of being in simple shape and, as the example shows, is easy to use.


f_s = 20,000
f_c = 900
n = 15
K = 0.403
Example
M = 80,000 ft lb, b = 12", d = 20", d' = 2"
d'/d = 0.10, R = 80,000 x 12 / 12 x 20² = 200
from diagram p = 0.0114; As = 0.0114 x 12 x 20 = 2.74 sq in
p' = 0.005, A's = 0.005 x 12 x 12 = 1.20 sq in
As/bd = p = Tension Steel Ratio
A's/bd = p' = Compression Steel Ratio
R = M/bd²

FRANK S. BAILEY,
Assistant Structural Engineer,
Procurement Division, Public Works Branch,
U. S. Treasury Dept.
Washington, D. C.,
Nov. 6, 1935.

Sewage Filtration

Sir—I note the comment, p. 862 of your issue of Dec. 19, 1935, on the proposed use of rapid filtration for settled sewage at Goshen, Ind., without the use of coagulants. It will be of value to have operating results from this plant installation, as similar processes have been used for a short time in both New Jersey and Pennsylvania.

It may be recalled that 25 years ago Mr. Bassett, of Summit, N. J., built a sewage plant for Lakewood, N. J., in which upward-flow filtering units, consisting of layers of rye straw held between iron gratings, were used. Unfortunately, the straw did not work very well, because as soon as any appreciable clogging occurred a hole broke through it and put the filter out of commission.

It will be quite interesting to some of us who have had many trials with the older sewage plants to watch the performance of the Goshen installation. The writer believes that such a process without the use of a coagulant is not as simple as it may appear, and it is quite likely that difficulties are going to arise.

F. E. DANIELS,
Principal Chemist,
State Dept. of Health.
Harrisburg, Pa.,
Dec. 30, 1935.

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January 9, 1936

Meet the Enumerator

CONTRACTORS may expect a visit from a census enumerator at any moment, for the second contracting census is under way. Construction activity in 1935 as represented by contract operations will be the basis of the survey, a part of the Census of Business. Tired as he may be of filling out official reports, the contractor will be doing his industry a real service by cheerfully cooperating in the compilation of the census. Principally he will be asked to state the volume of business that he took during the year, the amount of employment provided, and the expenditure for payrolls and materials. Subcontract work will be noted as such to prevent duplication, for subcontractors will also be covered. Construction is woefully lacking in information about its activities. The second construction census will be more complete, and thus more valuable, than the first census made in 1929, which has proved a mine of information concerning the industry; it deserves the cooperation of every contractor, general, special or sub.

Toward Normalcy

ACCORDING to the President's budget message, federal public works are to be returned to the regular budget and once more be made subject to specific authorization and appropriation by Congress. That is good news. Few practices of the past two years were more effective in shaking public confidence and arousing distrust than the practice of leaving it to arbitrary executive fiat to initiate construction of this or that vast project. Many of these projects were questionable or visionary; most of them lacked adequate planning. And, though they were defended on the score of putting men to work, the citizen viewed them as rather worse than pyramid-building attempts. He was still further disturbed at finding that much of the government's regular construction, needed every year, was withdrawn from regular budget and authorization procedure and was financed from unemployment-emergency funds, a process that tended to falsify the record as to both cost and result of the re-employment campaign. All these evil conditions are now to be happily ended. With equal satisfaction we are informed by the budget that a regular, consistent program of federal construction is to be followed henceforth; the $405,000,000 program for the coming fiscal year is an approach to the $500,000,000 indicated as normal annual requirement. These are innovations that signify a return toward normalcy.

PWA in Eclipse?

BY FAILING to make provision for further aid to non-federal construction through grants and loans to local governments, the new national budget indicates that the PWA is in eclipse. Presumably it can still use funds derived from sale of pledged municipal bonds to private buyers via the RFC, but since such sales have so far yielded only a trickle of funds they are not likely to support any substantial continuation of PWA activities. Unfortunately, most cities, states and counties are not yet in a position to resume their normal construction of needed improvements. It is true that municipal bonds have improved steadily in market rating, and that a number of cities raised money in the open market rather than borrow from the PWA; but most local authorities yet are unable or unwilling to follow this course in order to carry on their needed construction, though they would continue to cooperate with the PWA in striving to bring about re-employment. It is certain that municipal construction will slump under these conditions. But in partial compensation there will be an end to mischievous wage and hour restrictions, and this will help to restore the construction field to health. Unless the future work-relief message provides for continued PWA work, we may expect that there will be less public work, but it will be done by sounder method.

Roads to Politics

ONE FURTHER ITEM of the President's budget recommendations is of immediate interest to construction: the proposal that federal-aid highway authorizations be discontinued or disregarded and that appropriations be taken up anew each year. This proposal seeks to destroy the successful, constructive system of planned highway programs free of political contamination that has been developed by consistent policy of Congress with the hearty support of all who desire to see efficient administration. For many years a definite size of federal-aid program has been accepted, a practice that favored a carefully considered plan of development. The whole progress of the highway network has in fact been built on this plan, which permitted the state highway departments to develop an orderly construction campaign. If the system is now overthrown, as the President demands, proper planning will be at an end and logrolling and lobby activities will take control of roadbuilding. Our national highway construction, the best and most businesslike construction activity in the whole range of national works, will be destroyed. But Congress still has the power, fortunately, to avert this disastrous result.

Carving Shale

IN THE CONSTRUCTOR'S WORK of excavation, most prosaic of all construction operations, the earth's surface has been gouged by shovels, skimmed by scrapers, sucked up by dredges, pitted and ruptured by drilling and blasting, and even washed away by hydraulic giants. Seemingly every possible method of excavation has been developed; yet occasionally a new digging device breaks into use with startling suddenness. Such is the case at Fort Peck, where power saws are carving the tough shale at the spillway gate site into easily-handled chunks. Companion to the shale saws are more new digging rigs—queer augers that pierce holes of 5-ft. diameter deep into the shale bed. The magnitude of the spillway gate structure and the peculiar conditions at the site presaged the development of something special in excavation equipment. A vast expanse of shale overburden had to be carefully cut out and trimmed to a smooth base for the foundation mat; a long curving cutoff trench had to be carried to a depth of 30 ft.; and hundreds of deep 5-ft. holes had to be formed to carry a forest of reinforced-concrete stilts to support the gate even should the structure be undermined. The contractor provided

the special equipment needed. From the coal-mining field he borrowed modified coal saws for cutting the shale overburden and for excavating the trench. From the job machine shop he took a new design of auger that, dangling from the end of a crane boom, bores into the shale. The Fort Peck sawing and boring both add to the list of excavation achievements.

Building a New Art

REFLECTING the remarkable growth of knowledge in the new field of engineering soil study, the plan for an international conference on soil mechanics and foundation engineering, to be held next summer, offers an opportunity to bring to a focus the many different questions that activate the subject. Since the birth of scientific attack on soil mechanics and its associated problems of foundations, fills, excavations and slips, scarcely a dozen years ago, laboratory and field work has shown that a large part of the civil engineer's activities center about soil problems still unresolved. One of the most valuable things that the study to date has accomplished is to bring to light new problems, new questions to be answered by research and field observation, and new qualities and facts of soil behavior in need of exploration. The Harvard conference is likely to be of principal value in bringing together these problems; in doing so it will prepare the ground for the coming soil science, even though it contributes little toward the principles of that science. The latter objective may well be left to future research. But in order that even the gathering and sorting of soil problems may be possible, it is to be desired that a broad and numerous engineering representation take part in the congress. Comprehensive pooling of experience and observation is the surest means of collecting the raw material from which the future science will be wrought.

Occasional Odors Permissible

IN ITSELF of only local importance, the Aurora sewage-odor damage suit recently decided is significant in its implications. Owners of adjacent resort property sued to recover loss due to an alleged odor nuisance emanating from the plant. However, it was shown that after the opening of the plant the business of the resort owners increased rather than diminished. The Aurora plant has been instrumental in cleaning up the Fox River for many miles of its length, and has thus eliminated stream pollution and its attendant evils, which are generally the basis of suits for damages from sewage nuisance. After all, sewage plants deal with a noisome commodity, and the verdict rendered in this case recognizes that in the present state of an art dedicated to the performance of an essential service for the preservation of health and economic resources some occasional odor generation is unavoidable. The judge's charge, in fact, specifically laid down the principle of law that emission of occasional odors is not cause for a verdict against the operation and that something more must occur to damage the plaintiff than occurs generally to the neighborhood. If this principle is sustained, it will free well-designed and well-operated sewage plants from much nuisance legislation. But many a sewage plant is not so well cared for, nor is it possible with many as designed to avoid more or less continuous nuisance. For these the Aurora case offers no comfort. The necessity for expert operation and improved design to attain substantial odor control in sewage treatment therefore should not be underrated.

Florida's Water Supply and Canal

A NOTEWORTHY STUDY of groundwater conditions is under way in connection with the construction of the ship canal across Florida. It invites countrywide attention both because the canal is a national project and because the water supply of the whole Florida peninsula is involved. The rapidly growing importance of groundwater supplies gives further public significance to the questions at issue.

A preliminary report of the findings of this study, just rendered, is abstracted very briefly on another page of this issue. While Florida soil and water conditions are in many respects quite individual, the full study promises to be a fundamental contribution to knowledge of groundwater systems.

In Florida, as along much of the length of the coastal plain, the extensive deep groundwater reservoir that lies under the surface is a chief source of potable water supply. The individual feature of the Florida reservoir is its relation to the porous limestone that forms the principal underlying rock, and the presence of many natural spillways and outlets. The canal will add more spillway length, though at a low point of the groundwater surface. The present water table at this point is 25 to 45 ft. above the future canal surface on some 20 miles of length. The question before the board is what effect the creation of the canal cut will have on the peninsula's groundwaters.

Most immediate importance attaches to the broad conclusion of the board that the general groundwater reservoir of the peninsula will not be affected by the canal. Though the main water-bearing formation, the Ocala limestone, will be intersected on a length of 27 miles, a considerable mass of data on water pressures leads to the conclusion that the local drainage from a limited catchment area between the principal supply areas of the underground waters cut cannot have more than local effect, and will not perceptibly reduce the available supply in the state's groundwater reservoir.

It is to be noted that the term "local effect" has rather extensive meaning, as the canal cut is expected to depress the groundwater for as much as 10 to 15 miles back. This action, in all likelihood, will require provision of remedial measures, whether to check the outflow, to deepen wells, to close off large solution passages that may be encountered, or to preserve the springs for which the region is noted. The scope and cost of such remedial work have not been estimated by the board.

The preliminary report lacks the full quantitative findings that the importance of the subject warrants. No data are given from which the outflow into the canal may be computed or the losses of water head at different points estimated. Very likely these are to be obtained from further exploration and borings now in progress. The construction of the canal ought not to proceed to any large commitments, nor should the excavation penetrate far into the limestone layer until these investigations are completed and much more precise quantitative knowledge of supply, of pressure, of transmission of the water through the rock and of the effect on springs is available than the present report offers.

A sum of $20,000 has been appropriated for these additional investigations. Much more is necessary for a full study capable of answering all the questions involved. The importance of the issue and the unusual nature of the situation warrant a much larger investigation fund.

CURRENT NEWS

Passamaquoddy Gets Delayed Support

Petition promises support for formation of Passamaquoddy Dam Authority at next regular session of Maine Legislature

A MEMORIAL signed by over 150 prominent citizens of that state was presented by Governor Louis Brann of Maine, on Jan. 2, to President Roosevelt, promising to support the creation of a Passamaquoddy Dam Authority at the next regular session of the legislature in 1937.

The federal government has advocated the formation of the authority to take over and operate the plant upon completion. Although no official move has been made, it has been rumored that further federal appropriations for the project might be suspended until definite assurances should be given that such a body would be created. Governor Brann has consistently resisted proposals to have a special session of the legislature called for this purpose.

When asked whether the memorial might be construed as indicating that he would not call a special session to consider the bill, Gov. Brann replied that that would be the natural implication.

The regular session of the legislature does not convene until January, 1937. A War Department spokesman stated following submission of the President's budget message to Congress that work at Passamaquoddy would proceed. Government attorneys previously had expressed opinions questioning the legal status of the project in the absence of state legislation.

Reclamation Bureau Awards Major Contracts in December

The U. S. Bureau of Reclamation awarded 39 construction contracts totaling $12,787,440 during December, including those for four large dams. Bids on five more large projects have been received, but contracts have not as yet been awarded. The four dams for which contracts were let are: Seminoe dam, Casper-Alcove project, Wyoming, to Morrison-Knudsen, Utah Const. Co. and Winston Bros. Co., $2,759,805; Imperial dam, All-American Canal project, California, to the same combination of contractors, $4,374,241; Unity dam, Burnt River project, Oregon, to J. A. Terteling & Sons, Boise, Ida., $273,989; Bull Lake dam, Riverton project, Wyoming, to S. J. Groves & Sons, Minneapolis, $656,397. Other important contracts include three tunnels on Yakima Ridge Canal, Washington, to Morrison-Knudsen Co., Boise, Ida., $993,840; three tunnels on Shoshone Canyon Conduit, Wyoming, to Utah Const. Co., Ogden, $614,510; cement for Imperial dam to three California mills, $588,750. Bids have been received for the Alamagordo dam, New Mexico; four tunnels on the Black Canyon Conduit Canal, Idaho; raising of Arrowrock dam, Idaho, and the construction of two canals on the Ogden River project, Utah.

Army Engineers To Be Paid For WPA Work

Instructions issued by WPA Administrator Hopkins and General Markham, Chief of Engineers, U. S. Army, require state works progress administrators to reimburse the Corps of Engineers for consulting services of an extensive nature rendered by district and division engineers.

When engineer officers were authorized several months ago to serve in a consulting capacity on WPA projects, particularly waterway improvements, it was considered as part of routine supervision and inspection, to be undertaken by regularly employed personnel, with expenses absorbed by the district offices of the War Department.

For services involving a detailed engineering check of plans and specifications, extended inspection or major design, engineer officers are instructed to submit an estimate of the cost in advance and WPA administrators are instructed to charge this expense against the individual project.

Chickamauga Dam Construction Authorized by TVA

Immediate construction of the Chickamauga Dam, located on the Tennessee River seven miles above Chattanooga, has been authorized by the Tennessee Valley Authority. The structure, one of five authorized at the last session of Congress, will have a length of 5,685 ft. and a maximum height of 104 ft., to impound 421,000 acre-ft. of water in a lake extending 60 miles upstream. No power installation is planned at the present time. Estimated cost of the structure is $32,000,000.

Chickamauga is the fifth in the series of dams constructed on the Tennessee River for flood control, navigation and electric power production. The series, starting at the downstream end, is: Pickwick Landing, Wilson, Wheeler, Guntersville, Chickamauga.

The authority's program for developing a channel for 9-foot navigation is well under way. When Pickwick Landing, Wheeler, Guntersville, and Chickamauga dams, now authorized and under construction, are completed a total of 323 miles of water will have been made thus available for navigation. The river is 652 miles from Knoxville to Paducah.

Chickamauga Dam will be 5,685 feet long, including two earth fill sections on either side, a concrete spillway section, a concrete intake structure and a navigation lock. The navigation lock will have a maximum lift of 53 feet. The lock chamber will be 60 feet wide between walls, and 360 feet long. A 24-foot roadway will cross the top of the dam.

Lee G. Warren is construction engineer in charge, and Edwin M. Whipple is construction superintendent. Arthur A. Morgan is chief engineer of the Tennessee Valley Authority and C. A. Bock is assistant chief engineer.

East River Tunnel At New York

Allotment of $58,365,000 approved for a vehicle tunnel between Manhattan Island and Long Island

PRESIDENT ROOSEVELT has approved an allotment of $58,365,000 for the construction of a vehicle tunnel under the East River at New York contingent upon enactment by the state legislature of an enabling statute that would vest in the East River Tunnel Authority broader powers than now reside in the Queens-Midtown Tunnel Authority, which was set up by the state legislature last year. Of the total federal allotment, $11,235,000 would be a grant and $47,130,000 a loan secured by the bonds of the new tunnel authority.

New tunnel authority

Both houses of the New York state legislature, on Jan. 7, passed a bill creating the New York City Tunnel Authority to replace the present Queens-Midtown Tunnel Authority. Under the approved bill, in addition to providing the tunnel authority with the broader powers asked for by the PWA, the tunnel authority is authorized to build a vehicle tunnel from the Battery at the lower end of Manhatton Island to Hamilton Ave. in Brooklyn. Such a tunnel would give a much needed direct connection between the waterfronts of the two boroughs. The tunnel, passing under Governor's Island, would be about 8,000 ft. long.

The bonds of the new tunnel authority will be payable solely from tolls and may have a maturity not exceeding 50 years. Title to the tunnels reverts to New York City when the bonds and other obligations are discharged.

Tunnel location

The proposed vehicle tunnels will have exit and entrance plazas in the neighborhood of 38th St., on Manhattan Island, between First and Seconds Aves., and will extend under the East River to near the junction of Jackson and Borden Aves. in Queens. The location and general arrangement of the exit and entrances at the ends of the tubes have not been definitely fixed by the tunnel authority but the plans under consideration call for roadways in Manhattan coming to the surface by long loops that will bring the exit and entrance plazas on the west side of First Ave. This complete change of direction to reach the surface is dictated by rising ground to the west of Second Ave.

Queens tunnel plaza

In Queens special provision will be made for separation of traffic for the local industrial area near the tunnel mouth and traffic for points farther out on Long Island. All tolls are to be collected on the plaza in Queens.

The tunnel will have a total length of 7,200 ft. from portal to portal and will be 94 ft. below water level at the deepest point, practically the same as the Holland tunnel. Each tube will be 31 ft. in diameter, slightly

larger than the Holland tunnel and similar to the Midtown Tunnel under the Hudson River. The roadway will be 21 ft. wide except in the curved sections in Manhattan where it will be 24 ft. The maximum adverse grade in Manhattan will be 3.2 per cent and in Queens 3.5 per cent; and the descending grades will be 3.75 in Manhattan and 4.0 per cent in Queens.

There will be two main ventilating shafts at the bulkhead line on each side of the river and an auxiliary shaft on the long approach and exit tunnels on the Manhattan side. Tunnel construction operations will be begun from construction shafts, one on the Queens side and two in Manhattan. As these shafts can be located in the street, work on the tunnel can be begun as soon as the tunnel authority can prepare detailed plans of the shield-driven sections upon which to take bids.

On the Manhattan side tunnel driving will start in rock, but will be in soft ground before reaching the shaft for the ventilating building. In the river the shield will pass through both rock and soft ground before reaching the rock reef which lies at the westerly side of the river; after leaving the reef it will be in soft ground for about 1,000 ft. before reaching rock on the Queens side. From the Queens shaft the tunnel will be partly in rock and partly in soft ground. On this account tunnel driving will be slow.

The tubes are to be built of cast iron segments except in the curved sections in rock on the Manhattan side where they will be of steel.

The present Tunnel Authority is made up of Alfred B. Jones, chairman, Albert T. Johnston and William H. Friedman. Ole Singstad, consulting engineer on tunnels of the Port of New York Authority, former chief engineer of the Holland Tunnel, is acting as chief engineer for the tunnel authority.

Florida Canal Investigation Proposed in Senate

An investigation of the Florida Canal has been proposed in a resolution, presented in the Senate by Mr. Vandenburg of Michigan, calling upon the Senate Commerce Committee to report on various aspects of the ship canal which is now under construction. The resolution calls for a study of the nature and extent of the expenditures for construction and maintenance of the canal; the sufficiency of the plan, and whether it should be a sea level or lock canal; the effect of the canal on groundwater supplies and adjacent areas; the nature and the extent of the traffic to determine whether it would be sufficient to warrant the expenditure. A recent report by engineers stated that the Florida Canal would have very little ill effect upon the water supply in the adjacent areas (*ENR*, Jan. 9, 1936, p. 59). The committee is also instructed to report conclusions upon the advisability of starting projects without an enabling act of Congress.

President Roosevelt stated on Dec. 17 (*ENR*, Dec. 19, 1935, p. 864), that the Florida Canal is a major undertaking and that Congress should have an opportunity to pass upon it before funds are allotted for its construction. The budget estimates for river and harbor work submitted this week include the canal, according to the President, although no specific item appears.

Works Program Included In Budget

Federal budget for 1937 includes $404,960,000 for continuation of federal public works program, but no provision is made for federal-aid highway funds, nor are funds provided for the continuation of local public works program

Washington Correspondence

A FEDERAL public works program of $404,960,000 is included in the 1937 budget submitted to Congress by President Roosevelt on January 6. This includes $228,000,000 to be transferred from previous emergency appropriations to carry on works already underway, thus involving a new appropriation of only $187,000,000. The President recommends cancellation of the $125,000,000 authorization previously made by Congress for federal-aid highway construction in 1937, and making it applicable to the fiscal year 1938.

Thus does the President initiate the program that he has frequently anticipated in stating that the nation should support an annual expenditure of $500,000,000 for planned public works. The figure for 1937 has been cut in order to achieve a balanced budget for the government's ordinary operations, in which federal public works are now incorporated. It is $333,000,000 less than the total amount made available for such projects in '36, considering allotments made from emergency funds. Whether Congress will let the President's figure for 1937 stand is a question but the budget estimate is all that he will recommend. Pointing to a balanced budget for the government's regular activities, in which federal public works and the CCC are now included, the President warned Congress that if it goes in for legislation involving additional appropriations, such charges on the Treasury should be covered by new taxes.

No funds for housing

There is no new money for continuing the program of local public works by grants and loans to cities. This definitely presages liquidation of PWA. There is nothing for low-cost housing and nothing for direct relief. Expenditures in 1937 out of last year's appropriation of $4,880,000,000 for FERA, WPA, PWA and other agencies are expected to total $1,102,824,632, against estimated expenditures in the present fiscal year (1936) of $2,869,068,187. Last year's appropriation has all been obligated, allotted or is beyond recall, according to the President.

The relief works program will be continued but is not included in the budget submitted this week. The President's estimate of new funds needed for 1937 will be presented two months hence if Congress heads towards early adjournment; later, if the session is prolonged, but it will be presented at least 30 days before the probable date of adjournment. The work relief program in 1937 will be confined to WPA and will not differ in character from that now under way. The President explained that there is a vast reservoir of projects available that greatly exceed present allotments.

Federal-aid highways

The $405,000,000 estimate for federal public works includes $60,000,000 for federal-aid road construction in the present (1936) fiscal year. This is applied to the balance of $85,000,000 needed to cover the $125,000,000 program previously authorized for 1936 and is represented as sufficient to meet commitments maturing during 1937. Deferring until 1938 appropriation of a like amount previously authorized for 1937 is described by the President as an attempt to correct a thoroughly pernicious system by which Congress authorizes the Department of Agriculture to make moral contracts with the states for future road building. Thus Congress is always involved in making good promises made a year or two before, he said.

The President defended his policy with reference to curtailment of federal-aid highway construction in his budget message, as follows:

"This course appears fully justified in view of the fact that during the years 1933 to 1936, inclusive, there has been made available from emergency funds a total of approximately $1,192,000,000 for the construction of highways and the elimination of grade crossings, and that from these funds there will be available for expenditure during the fiscal year 1937 a total of more than $250,000,000 in addition to the $60,000,000 provided for in the general public works program. Moreover, roads of secondary classification and farm to market roads are being constructed under allotments of emergency funds in amounts approximating $115,000,000."

Division of funds

The 1937 budget estimate of federal public works totals $404,960,000 as compared with $218,409,000 appropriated in 1936 directly for the several federal departments. The increases are due largely to the fact that during last year funds for rivers and harbor work, the Bureau of Reclamation, and other projects, were provided from money appropriated under the emergency relief act.

Included in the budget estimate is $43,000,000 for the construction program of the Tennessee Valley Authority during 1937, compared with $36,000,000 appropriated for 1936; $4,000,000 for the construction program of the Veterans Administration compared with $21,250,000.

The Department of the Interior is assigned a total of $91,310,000. This includes $3,500,000 for Indian Reservation roads, $6,500,000 for National Park roads and National monuments, $9,600,000 for continuation of the construction of the Boulder Canyon project and $6,500,000 for the All-American Canal. The operations of the Bureau of Reclamation are allotted $64,710,000, under which the principal items are as follows: Gila project, Arizona, $2,500,000; Salt River project, Arizona, $2,300,000; Central Valley project, California, $18,000,000; Grand Valley project, Colorado, $200,000; Boise project, Idaho, $1,960,000; Carlsbad project, New Mexico, $900,000; Deschutes project, Oregon, $450,000; Owyhee project, Oregon, $900,000; Grand Coulee Dam, Washington, $22,000,000; Economic survey, Columbia Basin project, Washington, $250,000; Yakima project, Washington (Roza Division), $2,500,000; Provo River project, Utah, $2,750,000; Casper-Alcova, Wyoming,

$4,500,000; Riverton, Wyoming, $900,000; Shoshone, Wyoming (Hart Mountain Division), $1,750,000.

The construction program of the Department of Justice is allotted $4,500,000, and $3,800,000 goes to the Department of State for the International Boundary Commission, of which $1,200,000 is for the Rio Grande rectification work, $1,600,000 for flood control on the lower Rio Grande, and $1,000,000 for the construction of a diversion dam near El Paso, Texas.

The Treasury Department gets $61,050,000, of which $50,000,000 is for federal buildings outside of the District of Columbia. Within the district the largest item is $5,000,000 for a new War Department building.

Rivers and harbors

The President's budget estimate of appropriations for the Corps of Engineers for the fiscal year 1937 totals $184,498,008, as compared to $189,947,095 for the current fiscal year, which was made up of regular appropriations by Congress amounting to $60,260,926 and allotments of $129,686,169 under the Emergency Relief Appropriation Act.

The recommended appropriation of $184,498,008 for the 1937 program includes $129,000,000 for rivers and harbors, and, in addition, the following items: maintenance and improvement of existing river and harbor works, $38,677,899; flood control, Mississippi River and tributaries, including emergency funds, $15,811,309; flood control, Sacramento River, Calif., $1,000,000; Lowell Creek, Alaska, $8,000; Salmon River, Alaska, $800.

President Roosevelt stated that the estimate for rivers and harbors in the general public works program includes the Passamaquoddy tidal power project and others that were initiated with allotments of relief-works funds, but the exact amount included for Passamaquoddy was not revealed.

Regular appropriations recommended in the 1937 budget for government departments and agencies whose activities include engineering and construction are generally larger than appropriated funds for the current fiscal year. Large increases are generally explained by the fact that work previously financed by allotments of emergency funds now is covered in the regular budget. Selected items, for various governmental agencies and bureaus, as shown by the budget estimate of new appropriations, compared with appropriations of 1936, are as follows:

	1937	1936
Dept. of Agriculture:		
Weather Bureau	$3,909,824	$3,439,204
Forest Service	18,410,833	12,617,473
Public Roads	60,000,000	51,059,256
Agricultural Engineering	452,269	423,269
Commerce Department:		
Bureau of Standards	1,854,500	1,802,500
Bureau of Lighthouses	9,472,420	9,431,000
Coast and Geodetic Survey	2,600,500	2,360,900
Interior Department:		
General Land Office	3,183,700	3,010,700
Bureau of Indian Affairs	28,514,231	28,187,680
Bureau of Reclamation	81,903,600	15,072,100
Geological Survey	2,362,560	2,285,560
National Park Service	16,028,080	15,871,390
Navy Department:		
Bureau of Engineering	20,500,000	19,662,000
Bureau of Construction and Repair	19,200,000	18,288,000
Bureau of Yards and Docks	12,590,000	26,491,800
Treasury Department:		
Procurement Div., Public Works Branch	66,405,000	73,536,700
War Department:		
Corps of Engineers	184,498,008	60,260,926
Independent Establishments:		
Emergency Conservation Work (CCC)	246,000,000	.....
Federal Power Commission	1,741,000	379,024
Natl. Capital Park and Planning Com.	400,000	800,000
Tennessee Valley Authority	43,000,000	36,000,000

EXPENDITURES FOR PUBLIC WORKS AND RELIEF WORKS OUT OF PRIOR EMERGENCY APPROPRIATIONS AS ESTIMATED IN THE FEDERAL BUDGET FOR 1937*

	Estimated, Fiscal Year 1937	Estimated, Fiscal Year 1936	Actual, Fiscal Year 1935
I. Public Works:			
Administrative expenses, Public Works Administration	$15,000,000	$20,000,000	$14,561,002.60
Boulder Canyon project	9,100,000	15,755,300	23,820,507.04
Loans and grants to states, municipalities, etc.	325,756,000	52,450,000	137,707,417.46
Loans to railroads	.....	40,000,000	66,230,752.95
Public highways	236,518,000	276,543,000	317,356,940.05
River and harbor works	84,511,000	150,510,000	147,924,751.64
Rural Electrification Administration	2,500,000	5,000,000	16,820.93
Tennessee Valley Authority	.....	29,601,614	36,148,537.34
Other public works (national defense, public buildings, etc.)	214,578,732	409,735,466	312,793,647.83
Total, public works	887,963,732	999,595,380	1,056,560,377.84
II. Works Progress Administration	†.....	1,000,000,000	.....
III. Aids to Home Owners:			
Home loan system	.....	57,402,300	75,686,784.08
Emergency housing	61,000,000	49,000,000	6,479,835.47
Federal Housing Administration	20,000,000	14,082,985	15,963,873.02
Resettlement Administration	150,000,000	73,200,000	1,761,663.06
Subsistence homesteads	.....	900,000	3,661,937.71
Total, aids to home owners	231,000,000	194,585,285	103,554,093.34
Total, public works and relief works	1,118,963,732	2,194,180,665	1,160,114,471.18

*The budget recommends an appropriation of $404,960,000 for a general public works program including transfer of unexpended balances from emergency appropriations totaling $228,000,000. It is estimated in the budget that expenditures in 1937 out of the recommended appropriation of $404,960,000 will total $322,367,000.

†Not yet estimated.

SOCIETY CALENDAR

ASSOCIATED GENERAL CONTRACTORS OF AMERICA, annual meeting, Miami, Fla., January 13-15.

BRICK MANUFACTURERS ASSOCIATION OF AMERICA, annual meeting, Cleveland, Ohio, January 14-16.

AMERICAN SOCIETY OF CIVIL ENGINEERS, annual meeting, New York City, January 15-18.

AMERICAN ROAD BUILDERS' ASSOCIATION, annual convention and road show, Cleveland, Ohio, January 20-24.

CONSTRUCTION EQUIPMENT ASSOCIATION, first annual meeting, Cleveland, Ohio, January 20-24.

CANADIAN CONSTRUCTION ASSOCIATION, annual meeting, Hamilton, Ont., January 21-23.

AMERICAN SOCIETY OF HEATING AND VENTILATING ENGINEERS, annual meeting, Chicago, Ill., January 27-30.

NATIONAL PAVING BRICK ASSOCIATION, annual meeting, Columbus, Ohio, January 29-31.

ENGINEERING INSTITUTE OF CANADA, annual meeting, Hamilton, Ont., February 6-7.

AMERICAN CONCRETE INSTITUTE, annual meeting, Chicago, Ill., February 25-27.

AMERICAN SOCIETY FOR TESTING MATERIALS, regional meeting, Pittsburgh, Pa., March 4.

AMERICAN RAILWAY ENGINEERING ASSOCIATION, annual meeting, Chicago, Ill., March 10-12.

NEW YORK STATE SEWAGE WORKS ASSOCIATION, annual meeting, New York City, January 14-17.

NEW YORK STATE COUNTY HIGHWAY SUPERINTENDENTS ASSOCIATION, annual meeting, Albany, January 15-16.

METROPOLITAN SECTION, AMERICAN SOCIETY OF CIVIL ENGINEERS, New York, Jan. 22.

LOUISIANA ENGINEERING SOCIETY, annual meeting, New Orleans, La., January 24-25.

WEST VIRGINIA SOCIETY OF PROFESSIONAL ENGINEERS, annual meeting, Huntington, January 27-28.

NEW JERSEY SECTION, AMERICAN WATERWORKS ASSOCIATION, Waterworks Session, Trenton, January 29.

ASSOCIATION OF HIGHWAY OFFICIALS OF NORTH ATLANTIC STATES, annual meeting, Atlantic City, N. J., February 12-14.

SOUTHWEST ROAD SHOW AND SCHOOL, Wichita, Kan., February 25-28.

Wallace Thompson, Editor of Engineering Magazine Dies

Wallace Thompson, editor of *Ingeneria Internacional* died Jan. 7 at his home in New York City. He was 53 years old.

Mr. Thompson was born in Topeka, Kan., and he attended Washburn College, graduating with a B. Sc. degree in 1903. He then became assistant editor of the magazine *Modern Mexico*, and in 1904 he became news editor of the *Mexican Herald*, Mexico City, Mexico, a position he held until 1910. In 1910 he was appointed political correspondent for the Kansas City *Journal*, and from 1911 to 1913 he was Paris correspondent for various American newspapers.

In 1914 Mr. Thompson returned to New York and became the managing editor of the magazine *Town and Country*. Later he held a similar position with *Popular Science Monthly*, and since 1927 has been editor-in-chief of the magazine *Ingeneria Internacional* and was Washington correspondent on NRA affairs for the McGraw-Hill Publishing Co., Inc. He has contributed many articles to magazines and was regarded as an authority on Latin American affairs.

Willacy Case Remanded to District Supreme Court

Indictment of Maj. Charles R. Olberg and Perry A. Welty, former PWA engineers, and other defendants in the government's suit alleging conspiracy to defraud in the Willacy County, Tex., irrigation project has been sent back for trial in the Supreme Court of the District of Columbia. The case was remanded by the Court of Appeals of the District of Columbia which reversed, on Jan. 6, the judgment of the lower court in sustaining a demurrer by the defendants to indictment by a special grand jury. (*ENR, March 28, 1935, p. 464.*)

East Coachella Tunnel Holed Through

The 18-mi. East Coachella tunnel of the Southern California Metropolitan Water District's Colorado River aqueduct system was holed through Jan. 2. Located in the Little San Bernardino range of mountains about 150 mi. east of Los Angeles, the East Coachella tunnel is the longest underground section of the aqueduct system, which includes 37 tunnels, totaling 108 mi. in length. The tunnel diameter is 16 ft. Work on the bore was started three years ago. Ten days before the East Coachella was holed through crews completed excavation of the 3-mi. long Thousand Palms tunnel located only a few miles from the East Coachella bore. The Thousand Palms crews, during December, completed 1,001 ft. of tunnel in 26 days, an average of 14.1 ft. per day.

The blasting of the rock barrier between the Fargo and Berdoo camps on the tunnel line was witnessed by F. E. Weymouth, chief engineer; B. C. Ledbetter, engineer in charge of the Coachella Division, and other officials of the district.

Ickes Starts Work on Housing Project

Tapering off of federal participation in public housing held necessary by Ickes at groundbreaking ceremonies for Williamsburg project

MATCHING of federal and city funds, with state aid where possible, to carry on low rent housing construction in the future, was advocated by PWA Administrator Ickes, who declared, at ceremonies incident to initiation of construction on the Williamsburg project, New York, Jan. 3, that the federal government cannot meet, unaided, the demands for public housing.

Municipalities that want housing, he said, must be willing and able to assume responsibility for a share of the financing and for initiation, construction and operation of projects. Administrator Ickes endorsed the housing bill that Senator Wagner will introduce this session, creating an $800,000,000 fund for loans and grants to city housing authorities, authorization of which, with the fullest possible powers, in all states is urged by the federal administrator.

The federal government should not abandon work in the field pioneered by PWA but "somewhere along the line a tapering off of public housing from Washington must begin," said Mr. Ickes, "and I hope to see the incoming Congress provide for this while accepting responsibility for continuing the government attack on this grave social problem."

The Williamsburg housing project is the largest on the PWA low rent program. It calls for the demolition of sub-standard buildings on twelve blocks. Dwelling units for 1,625 families will be provided by the project, which is to cost $12,783,000. Only contracts for foundations have been awarded.

DEMOLITION of existing structures to make way for the PWA's housing project in Williamsburg section of Brooklyn, N. Y. Razing of these old buildings has been completed and work started on the new development.

Canadian Court Revalues Contractor's Damage Award

Action for damages, arising out of the construction of a dam on the Lievre River, Quebec, taken by the W. I. Bishop Co., contractors of Montreal, against the James Maclaren Co., as owners, which was settled by the Superior Court of Quebec some months ago, in favor of the plaintiff, for a sum of $293,585, has just been amended by the Court of Appeals of the Province of Quebec, the damages now being assessed at $1,429. Claims were based on the nature of material excavated, as revealed by borings, additional cost for winter construction, and other factors. It is probable that the case will now be taken to the Supreme Court of Canada, at Ottawa.

Chicago Sanitary District Reports On Water Diversion

The Sanitary District of Chicago has reported to the Supreme Court that with the $58,813,040 allotted to it by the PWA, it has been able to comply with the Court's order to reduce diversion of water from Lake Michigan to not more than 5,000 sec.-ft. The report also indicates that construction on the sewage disposal program has been progressing with such steadiness that the sanitary district will be enabled to cut diversion to 1,500 sec.-ft. by Dec. 31, 1938, as it was ordered to do by the Supreme Court on April 20, 1930. Construction work has now progressed to a point where 35 per cent of the program has been completed. About $20,000,000 has been spent since the work started in January, 1934. Contracts have been awarded to date for $26,000,000 or 45 per cent of the program.

Commerce Department To Study Building Economics

Studies of the fluctuation of demand for industrial and commercial building are to be undertaken by a newly organized unit in the Bureau of Foreign and Domestic Commerce, U. S. Department of Commerce, Washington. The building demand is to be investigated in relation to other economic factors, such as the development of new industries, volume of manufacturing production, industrial earnings, interest rates, and other factors. The study will be under direction of Lowell J. Chawner, chief of the Construction Economics Section.

This work is the first item to be undertaken in a larger program of construction economic studies, which will deal with private construction, leaving public-works construction to other governmental departments. One objective of the program is to work toward the stabilization of employment in the construction field, involving a total personnel of more than 5,000,000 workers but at present subject to extremely violent variation, from a glut of demand to almost complete idleness. Future elements of the program will include construction cost trends and economic aspects of new methods of construction.

Resources Committee Gets Funds For Rio Grande Study

An allotment of $200,000 has been made to the National Resources Committee for a survey of basic data essential in reaching a satisfactory basis for the equitable apportionment of waters of the Upper Rio Grande River between the states of Colorado, New Mexico, and Texas. In making the announcement, Administrator Ickes pointed out that the federal government has large investments in enterprises involving the use of the Rio Grande waters and may have additional investments in the future.

At a meeting of the Rio Grande Compact Commission held in Santa Fe, N. M., on Dec. 2-3, and at which representatives from the three states met to discuss problems, a request was made that the National Resources Committee, through its Water Resources Committee, undertake an investigation of the water resources of the Rio Grande River (*ENR*, Dec. 26, 1935, p. 901).

Greenbelt Project Plans Furthered by Suit Dismissal

The Resettlement Administration announced, following the dismissal, on Jan. 3, of a suit to restrain Administrator Tugwell, that work would be speeded on the greenbelt community near Bound Brook, N. J. The suit, which was ordered dismissed by the District of Columbia Supreme Court, had been brought by Franklin Township, N. J., and four property owners, to restrain Administrator Tugwell from establishing a community there.

In the action the township claimed that its municipal burden would be increased by 3,000 additional population and the property owners claimed their tax burden would be increased. The court held, on the defendant's plea, that as the township did not pay taxes it was not a proper plaintiff and that this was an action against the government which had not consented to be sued.

The project at Bound Brook is one of four rural-industrial communities being established by the Resettlement Administration. The others are located near Cincinnati, Milwaukee, and Washington, D. C.

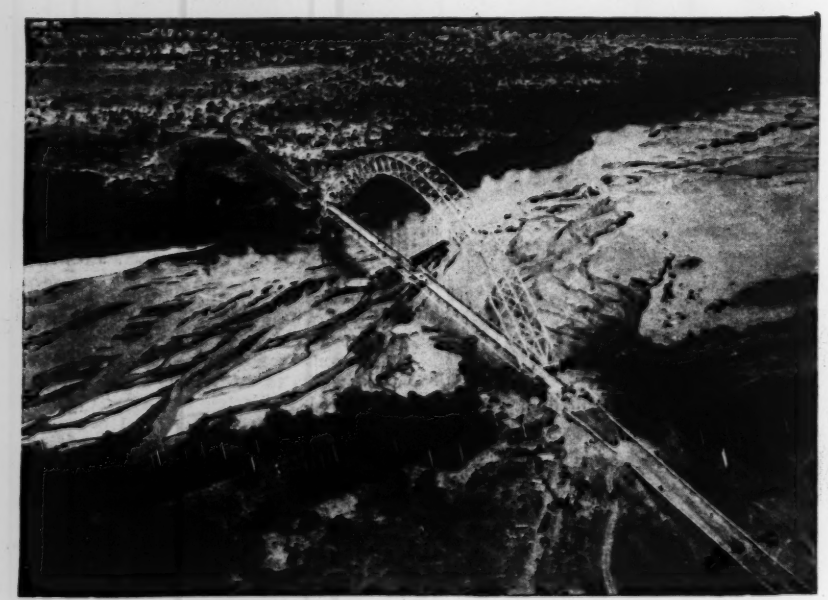
Large Steel Arch Bridge Opened in Africa

The large bridge across the Sabi River, which the Beit Trustees have presented to the people of Rhodesia, was officially opened by Sir Herbert Stanley, Governor of Southern Rhodesia, on Dec. 20. At the request of the government the bridge is to be called the Birchenough Bridge, in recognition of the services rendered by Sir Henry Birchenough, chairman of the Beit Trustees and president of the British South Africa Co.

The bridge, a highway structure, crosses the Sabi River with a single arch of 1,080-ft. span and 216 ft. rise. This span is exceeded by only two other arch spans—the Sydney Harbor Bridge in Australia and the Bayonne Bridge, at New York. It is the first long-span bridge constructed in the British Empire of modern high-tensile steel, a chrome manganese type having a yield point of 50,000 lb. per sq.in. The designer is Ralph Freeman of Sir Douglas Top & Partners, London. Mr. Freeman also designed the Sydney Harbor Bridge. Dorman Long & Co. Ltd., Middlesbrough, is the contractor.

The purpose of the bridge is to pgovide access for the settlers in the Melsetter and Chipinga districts to the markets of Salisbury and Bulawayo. These districts form a cul-de-sac, shut in on the east and south by mountains, and on the west by the Sabi River. Heretofore the outlet to the west was impassable for the greater part of the year owing to the treacherous sands in the bed of the river.

BIRCHENOUGH BRIDGE, across the Sabi River in Rhodesia.



Sewage Plant Wins Suit Over Odor Nuisance

A suit against the Aurora, Ill., Sanitary District by the owner of resort cottages on adjoining property alleging $20,000 damage from an odor nuisance has been decided in favor of the district. The suit was started in 1930, and came to trial early in December, and a verdict of "not guilty" was handed in Dec. 13. Claims made by the plaintiff were that lace curtains were rotted in a home one-fifth of a mile away and many witnesses claimed illness from the odors. Books of the plaintiff who owned resort cottages nearby to the plant showed more revenue in four years after the building of the plant despite the depression than the four years preceding its construction. The jury visited the plant during the trial finding it odorless. The defense introduced much testimony to the effect that odors from former river conditions were more pronounced and continuous than from the plant. Three daily tests for hydrogen sulphide of the clarified liquor to the filters during the summer season never showed, so the chemist testified, concentrations beyond a few tenths of one part per million. It was stressed that service and community clubs frequently held picnics on the plant grounds.

The defense was prepared by Robert J. Wing, local district attorney, assisted by Walter E. Deuchler and Walter A. Sperry, engineer and superintendent respectively for the Aurora Sanitary District.

Obituary

ELMER S. FOOTE, 57, civil engineer of Greeley, Colo., died at Memphis, Tex., Dec. 28. Mr. Foote was engaged in land development work in Texas.

THOMAS C. WILSON, a consulting engineer of New York City, died at his home in Rockville Center, L. I., on Jan. 1, at the age of 43.

E. R. MEREDITH, for the past 15 years assistant engineer of design with the Iowa state highway commission, died in Ames on Dec. 31. Mr. Meredith was 52 years old at the time of his death.

ROBERT FLETCHER, director emeritus of the Thayer School of Civil Engineering, Dartmouth College, Hanover, N. H., died at Hanover on Jan. 8, age 88 years. An outline of Prof. Fletcher's career will be published in next week's issue.

EDWARD GILLETTE, consulting engineer, Sheridan, Wyo., died at his home there on Jan. 3, at the age of 81. Mr. Gillette, who was at one time Wyoming state treasurer, was graduated from Yale University in 1876, and was engaged for the next four years with the U. S. Coast & Geodetic Survey. He then went to the Rio Grande Western R.R. as locating engineer and held that position for four years. During the following ten years he was locating engineer for the Chicago, Burlington & Quincy. He later became superintendent of Wyoming's water division no. 2 and later became engineer in charge of railroad location surveys for the U. S. Government in Alaska. He then served a four-year term as state treas-

urer of Wyoming and since 1911, has been engaged in consulting practice at Sheridan. In 1915 Mr. Gillette was appointed chairman of the board of review of the Northern Division of the U. S. Reclamation Service.

HARVEY STANLEY, former engineer of roadways, Charlotte Harbor and Northern Ry., and more recently a consulting civil engineer, Washington, D. C., died at Laurel, Md., on Dec. 30, at the age of 51. Mr. Stanley studied engineering at Maryland Agricultural College and Columbian University and then for three years worked as instrument man for the Maryland Geological Survey. He then went with the United Railways and Electric Co., Baltimore, and became engineer in charge of special work repairs. He then spent two years with the Seaboard Airline Ry. in tunnel and terminal work. Mr. Stanley later became chief engineer of location for the East and West Coast Ry., Fla., and later went with the Charlotte Harbor and Northern Ry.

ASA E. PHILLIPS, a consulting engineer, Washington, D. C., and former District Sanitary Engineer, died at his home on Dec. 31. Mr. Phillips was graduated from Lehigh University in 1890 and began practicing in New York City. He became engineer on flood prevention and sewage disposal for the District of Columbia in 1899 and held that position until 1917 when he was assigned by the War Department as a member of the Council of National Defense, and supervising engineer at Newport News, Va. He later became a member of the Engineering Board of Review for the city of Chicago and in 1927 was a delegate to the World Congress of Engineers at Tokyo and was a member of the board of engineers who planned greater Shanghai. While superintendent of the sewer division, District of Columbia, Mr. Phillips was named on a committee of engineers for the standardization of specifications for cement bought by the United States.

CONSTRUCTION STATISTICS FOR THE WEEK

ENGINEERING construction awards rise to a new high this week, $102,534,000, of which $32,000,000 is accounted for by the Chickamauga Dam in Tennessee. A moderate number of large awards and a very heavy volume of awards in the small and medium size range account for the other $70,534,000. The week's volume is made up of private, $7,177,000; public, $95,357,000, of which federal is $40,631,000; and state and municipal, $54,726,000. Corresponding values a year ago were: total, $31,883,000; private, $4,486,000; public, $27,397,000; federal, $7,418,000; and state and municipal, $19,979,000.

Public buildings at $25,862,000 and earthwork and waterways at $36,317,000 account for the largest part of the increase, although highways are up at $13,047,000, as are waterworks awards at $5,306,000; sewerage at $8,528,000; industrial buildings at $2,035,000; and commercial buildings at $2,495,000. Bridge awards total $3,664,000 for the week.

The larger awards include: plant improvements for U. S. Pipe & Fdry. Co., Chattanooga, Tenn., $600,000; school, Boston, Mass., $548,000; school, Paterson, N. J., $531,000; hospital and nurses' home at State Sanatorium, Westfield, Mass., $666,000; school, Detroit, Mich., $887,000; schools, Cleveland, Ohio, $940,000; highways by Illinois, $1,298,000; by Montana, $947,000; by New Jersey, $1,428,000; by North Carolina, $743,000; by Virginia, $428,000; by New York City, N. Y., Contract 13, Elevated Express Highway, foundations, superstructure with ramps, etc., $1,957,000; bridges by Montana, $662,000; by Maryland, over Jones Falls Valley, Baltimore, $574,000; by Massachusetts, superstructure over Chelsea Creek and approaches, Boston, $629,000; waterworks, Metropolitan Water District, Schedule 6-P and 7-P, Colorado River Aqueduct, 2 contracts, Los Angeles, Calif., $2,319,000; sewers, Onondaga County, closed sewer and disposal plant, WPA forces, Syracuse, N. Y., $2,000,000; sanitary storm and intercepting sewers, various streets, Akron, Ohio, $650,000; intercepting sewer, Oak Park, Ill., $1,850,000; Bureau of Reclamation, Tunnels 1, 2, 3, 4, Yakima Ridge Canal, Roza Irrigation Project, Yakima, Wash., $994,000; Tunnels 1, 2, 3, Shoshone Irrigation Project, Riverton, Wyo., $615,000; Bull Lake Dam, Riverton Irrigation Project, Wyo., $653,000; Chickamauga Dam, TVA, Tennessee, $32,000,000; swimming pool, Pittsburgh, $503,000.

New capital for the week includes non-federal PWA loans and grants, $62,019,000; state and municipal bonds sales, $8,358,000; and corporate security issues, $7,450,000.

CONTRACTS

(Thousands of Dollars)

	Weekly Average Jan. 1935	Prev. 4 Weeks	Week Jan. 9 1936
Federal Government	$3,979	$13,780	$40,631
State and municipal	15,399	37,355	54,726
Total public	$19,378	$51,135	$95,357
Total private	5,977	4,589	7,177
Week's total	$25,355	$55,724	$102,534

Cumulative to date:
1935....$77,033,000 1936....$159,270,000

NEW PRODUCTIVE CAPITAL

(Thousands of Dollars)

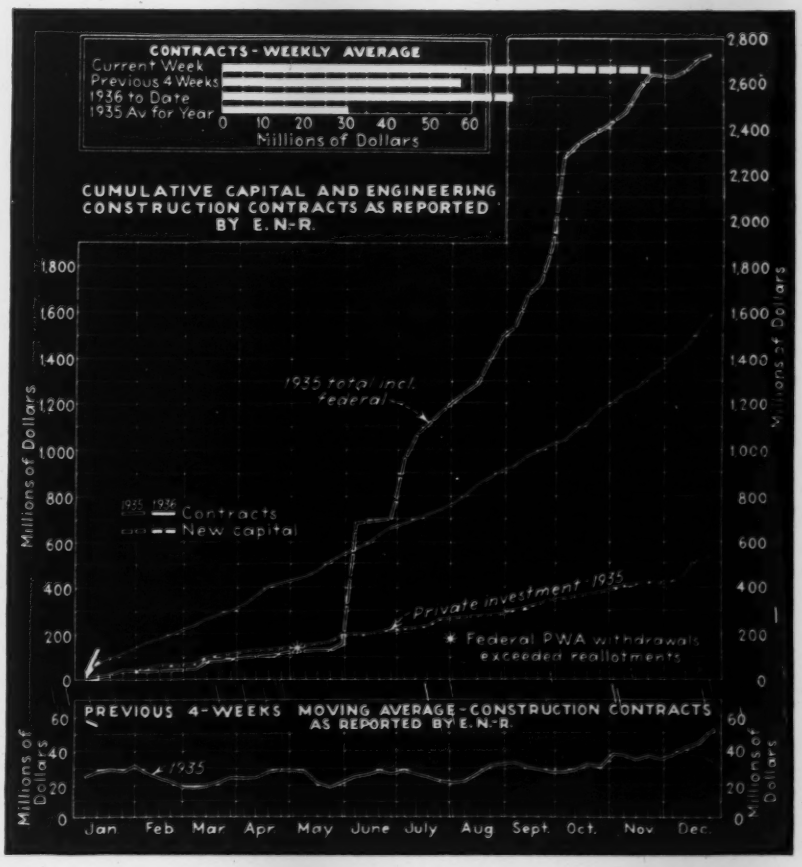
1936	Week Jan. 9	Cumulative
State and municipal	$8,358	$18,192
PWA nonfederal	62,019	62,019
Corporate issues	7,450	8,410
Total new capital	$77,827	$88,621

Cumulative to date:
1935...$10,580,000 1936...$88,621,000

Note: These figures include private bonds, and stocks sold for productive purposes; state and municipal bonds for construction; PWA loans and grants to states and municipalities, including the special highway funds; PWA private loans, and allotments for federal construction, deficiency act funds. An arbitrary percentage (25%) of the WPA allotments and local contributions to WPA work is included to allow for the capital additions through the Works Progress Administration division of the new program.

INDEX NUMBER

ENR Cost	1913 = 100	1926 = 100	ENR Volume	1913 = 100	1926 = 100
Jan., 1936	**199.48**	**95.89**	**Dec., 1935**	**254**	**111**
Dec., 1935	194.90	93.69	Nov. 1935	171	75
Jan., 1935	198.72	95.52	Dec. 1934	105	46
1935 (Av.)	195.22	93.84	1935 (Av.)	135	58
1934 (Av.)	198.10	95.23	1934 (Av.)	114	50
1933 (Av.)	170.18	81.80	1933 (Av.)	102	47


CONTRACTS - WEEKLY AVERAGE
Current Week
Previous 4 Weeks
1936 to Date
1935 Av for Year
0 10 20 30 40 50 60
Millions of Dollars
CUMULATIVE CAPITAL AND ENGINEERING CONSTRUCTION CONTRACTS AS REPORTED BY E.N.-R.
Millions of Dollars
1935 total incl. federal
1935 1936
Contracts
New capital
Private investment 1935
* Federal PWA withdrawals exceeded reallotments
PREVIOUS 4-WEEKS MOVING AVERAGE - CONSTRUCTION CONTRACTS AS REPORTED BY E.N.-R.
1935
Jan Feb Mar Apr May June July Aug Sept. Oct. Nov Dec.

Construction Equipment and Materials

Sludge Pump Developed For Moderate Size Plants

To meet the demand for a moderate size sludge pump for municipal sewage plants, the Novo Engine Co., Lansing, Mich., brought out a vertical sludge pump operating on the roller ring principle. The seal is maintained by two rolling rubber rings on the plunger. They are pressed against the cylinder wall and the side of the piston, making a liquid-tight seal, doing away with plunger packing and diaphragms.

The capacity is variable by simply changing the length of the stroke. This is accomplished by means of adjusting the eccentric on the drive shaft of the geared head motor, which also eliminates any intermediate drive between the electric motor and the pump. The standard pump is built for 47 strokes per minute. This, with the variable stroke, gives a capacity range of 47 to 66 g.p.m. These pumps are also available equipped with motors to operate at 30 strokes per minute minimum or 65 strokes per minute maximum. Variations are available on these speeds by changing the length of the stroke.

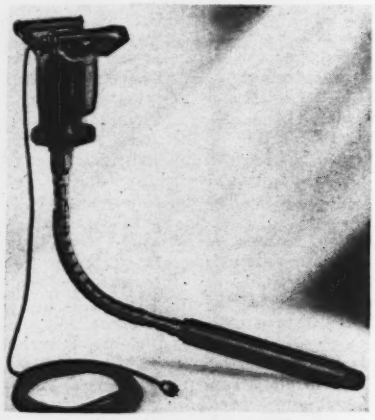
Motor Grader Designed For Heavy Work

Two new heavy duty motor graders, identical except for the power units, have been developed by the J. D. Adams Co., Indianapolis, Ind. Model 50 is powered by a six cylinder gasoline engine developing 59 hp. and Model 51 has a diesel engine of 57 hp. Five forward speeds give a range of from 1 to 15 m.p.h. Either machine may be had with a 12, 14 or 16 ft. blade. A scarifier can also be had on either grader.

Frame and drawbar design is all-welded box construction which increases strength and rigidity. This construction also permits a wider range of blade adjustments and improves visibility of the blade. Either two-wheel drive or four-wheel drive may be had on the model 50 and 51 graders. The scarifier is also optional on either model.

Maker Offers Ten Models In Vibrator Line

The photo shows Model Two, one of ten models, made by the Master Vibration Co., Dayton, Ohio. These concrete vibrators are furnished in diameters of 2½, 3, 4 and 6 in. with a power range of ½ to 2 hp. Two methods of varying the frequency of

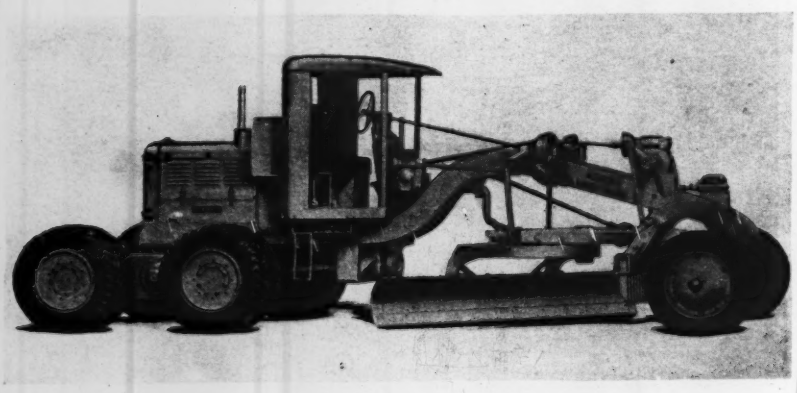


vibration are available: an adjustable generator cycle when operated from a Master generator set, and a built-in motor gear head. These vibrators are equipped with a Master vibrator repulsion induction motor capable of starting 550 per cent rated load with a light loss of only 5 per cent. Models One to Six are furnished with a wire core shaft. The other four models have motors built in the vibrator unit, and are all equipped with rubber insulated steel spacers and the rotating weight is insulated from the motor by a rubber seal and a flexible rubber connection.

New Equipment in Brief

Spring Toggle. A spring toggle for making attachments to hollow brick, tile or wire lath walls is now being produced by the Diamond Expansion Bolt Co., Inc., Garwood, N. J. The toggle is made with wings that engage a trunnion nut and a spring which forces the wings outward when the head has passed through the wall. One end of the spring is extended to prevent rotation of the head while tightening the bolt. Each wing is designed to form a complete toggle in itself, with a bearing on both sides of the hole.

Testing Motor. A small electric motor equipped with gear reduction for laboratory testing has been developed by the A. G. Hogmond Co., Flint, Mich. The motor comes in 6 different models. Model 85 has overall dimensions of 4½x4½x5 in. and weighs 3½ lb. It is equipped with a high speed shaft rotating at 56 r.p.m. and a slow speed shaft at 6 r.p.m. An oscillating shaft moves through an arc of 70 deg., and an indexing shaft stops at intervals of 60 deg. for a period of three seconds.



New Publications

A TRIP THROUGH A MODERN ARC WELDER FACTORY, Hobart Bros. Co., Troy, Ohio. 5½x8½, 40 pages.

BULK MATERIAL HANDLING MACHINERY, Palmer-Bee Co., Detroit, Mich. 7½x10½, 288 pages. Section 106 of general catalog 100.

J-BAR LOAD TRANSMISSION SYSTEM, J-Bar Co., Chicago, Ill., 8½x11, 15 pages. Dowel bars for highway joints.

BIGGER YARDAGES, R. G. LeTourneau, Inc., Peoria, Ill. 8½x11, 12 pages.

NICKEL-CLAD STEEL, Lukens Steel Co., Coatesville, Pa. 8½x11, 23 pages.

CONDOR ASBESTOS FRICTION MATERIAL, Manhattan Rubber Division, Raybestos-Manhattan, Inc., Passaic, N. J., 8½x11, 11 pages.

MULTISAFTY CABLE HIGHWAY GUARD, American Steel and Wire Co., Chicago, Ill. 8½x11, 40 pages.

THE REPAIR OF DAMAGED CAST IRON MACHINERY, Linde Air Products Co., New York. 8½x11, 7 pages.

INDUSTRIAL FRICTION MATERIALS, Johns-Manville, New York, 8½x11, 7 pages.

BAKELITE REVIEW, Bakelite Corp., New York, 8½x11, 40 pages, Silver Anniversary Issue.

THE WHYS AND HOWS OF DIESEL ENGINES, Caterpillar Tractor Co., Peoria, Ill. 4x9, 13 pages.

MOTOR TRUCK FACTS, Automobile Manufacturers Association, New York. 5⅜x8½, 48 pages.

THE CHICAGO COMMINUTOR, Chicago Pump Co., Chicago, Ill. 8½x11, 23 pages. Raw sewage cutter.

CENTRIFUGAL PUMPS, Allis-Chalmers Mfg. Co., Milwaukee, Wis. Bulletins, 2206, 2207, 2208, 2210. Each 8½x11, 4 pages.

VORTEX ELECTROPUMP, Lawrence Pump and Engine Co., Lawrence, Mass. 8½x11, 8 pages. Bulletin D-45.

Business Notes

NATIONAL TUBE CO., Pittsburgh, Pa., has announced the following personnel changes: J. E. Goble, formerly export manager, Oil Well Supply Co., New York City, has been appointed vice president in charge of sales; W. F. McConnor, formerly assistant sales manager, has become sales manager.

FISHER BODY DIVISION, General Motors Corp., will transfer Thomas P. Archer, vice-president in charge of operations, to the Grand Rapids Stamping Division when the new plant for that division is completed.

PENNSYLVANIA PUMP & COMPRESSOR CO., Easton, Pa., has appointed the Consulting Engineering Co., Pittsburgh, as representative in that district.

J. E. N. HUME, assistant manager of the General Electric Company's industrial department, has been appointed manager of the department, succeeding the late W. W. MILLER. Mr. Hume had been assistant manager for the previous six years and in that capacity was responsible for general sales direction and similar activities. GEORGE H. REED has been appointed industrial department manager of the New York district, succeeding FRED S. HARTMAN, who has retired.

C. H. & E. MANUFACTURING CO., Inc., has moved into its new plant at 3849 North Palmer St., Milwaukee, Wis.

CONSTRUCTION REPORTS

WATERWORKS

PROPOSED WORK

Calif., Arcadia—Municipality soon takes bids waterworks, incl. steel pipe, $80,000. Currie Eng. Co., Andreson Bldg., San Bernardino, engrs.

Calif., San Bernardino—Formation of water district at Huston Flats Rim of the World resort region, San Bernardino Co., has been voted by residents of the district which embraces 3,500 acres of land, consumation of the project will require construction of a dam across Huston Creek. $100,000. Specifications and plans for the dam are to be made preparatory to application to P.W.A. for assistance in financing. P. J. Cormack, San Bernardino, is one of the promoters of the project.

★ **Calif., San Jose**—San Jose Waterworks rejects offer of City Council to purchase water system for $4,500,000. City now contemplates construction of municipal supply and distribution system. Noted Dec. 23, C. D.—Dec. 26, E. N.-R.

Ind., Danville—Town Bd., G. W. Hadley, clk., soon takes bids c.i. pipe for watermains, $14,040. W.P.A. project.

Mass., Athol — Town, completing plans for plant and mains early in January. $100,000. P.W.A. project. Tighe & Bond, 180 High St., Holyoke, engrs.

Mass., South Hanson—Comrs. Plymouth Co., R. H. Pierce, M.D., supt. Plymouth County Hospital, rejected bids constructing 75,000 gal. elevated steel water tank. Will readvertise. Noted Dec. 9, C. D.—Dec. 12, E. N.-R.

Mich., Iron River—Municipality plans waterworks additions. Est. $30,000. E. Carey, Iron River, engr.

Mich., Midland, Bay City and Saginaw—Cities of Midland, Bay City and Saginaw retained Francis Eng. Co., engrs., Eddy Bldg., Saginaw, and C. W. Hubbell, engrs., Buhl Bldg., Detroit, to make engineering survey of Saginaw Valley and Saginaw Bay to determine most suitable source of water supply for above named cities.

Mont., Glasgow—City plans improving waterworks. $32,000. $9,000 P.W.A. grant allotted.

Neb., Falls City—City making plans constructing reservoir, to cover 100 acres. To exceed $25,000. Scott & Scott Lincoln, engrs.

N. M., Los Lunas—Municipality plans waterworks. $38,000. New Mexico Eng. Co., Albuquerque, engrs.

N. Y., Rochester—City's application to expand its water supply has been rejected by New York State Water Power Control Comn., and refused permission to take water from Lake Ontario. Noted Feb. 1, C. D.—Feb. 7, E. N.-R.

Wyo., Cody—City defeated bonds for constructing modern filtration plant and 12 in. supply line and $76,545 P.W.A. allotment rescinded. Noted July 5, C. D.—July 11, E. N.-R.

Ont., London—Public Utilities Comn., E. V. Buchanan, genl. mgr., plans constructing pump house and electrically driven water pump, 4 m.g.p.d. capacity. $25,000.

Ont., Niagara-on-Lake—Municipality plans extending watermain system.

Ont., Ottawa — Secretary Bd. Control soon takes bids Queen St. pumping station, replacing 3 reciprocating pumps, now obsolete with 3 modern turbine-driven centrifugal pumps, 6 m.g. capacity each. $60,000. W. E. MacDonald, City Hall, engr.

BIDS ASKED

Calif., Calexico—See "Contracts Awarded."

Calif., Fresno—Jan. 17, by Clerk Fresno Co., Court House, waterworks for Fresno County Waterworks Dist. 2. To exceed $10,000. Noted Aug. 20, C. D.—Aug. 22, E. N.-R.

Calif., San Diego—Jan. 28, by Purchasing Agent at office of City Clerk, for portion of El Capitan-Lakeside Pipe line, F. P. Wks. Project 5575, consisting of 4 mi. 48 in. and 2 mi. of 36 in. electrically welded steel pipe with protective coating of coal tar enamel or cement. F. D. Pyle, 524 F St., hydraulic engr. Noted Nov. 20, 1934, C. D.—Nov. 2, 1934, E. N.-R.

Calif., San Francisco—Jan. 21, by Public Utilities Comn., City Hall, constructing central pumps, covered reservoir with concrete roof and lining, valve house and inlet and outlet structures, install steel pipe lines together with slide gates, install valves, c.i. pipe lines, etc. N. A. Eckart, 425 Mason St., engr.

Ind., Brazil—Bd. P. Wks., L. Louderbach, chn., taking bids materials constructing reservoir, pumping equipment, pump house addition. $20,000. Work by W.P.A. labor. O. Jenkins, city engr.

Ind., Connersville—Bd. P. Wks., W. Dentlinger, chn., bids about Jan. 11, electrification of present plant, incl. 2 Diesel engines, 6 pumps, deep well and pump house. $114,500. P.W.A. project. J. W. Moore & Son, 838 Ind. Pythian Bldg., Indianapolis, engrs. Noted Feb. 19, C. D.—Feb. 28, E. N.-R.

★ **Ky., Covington**—Feb. 6, by City, City Hall, waterworks, incl. Contr. 2, 75,000 gal. elevated tank on 100 ft. tower; Contr. 3, extensions and improvements to distribution system; Contr. 4, traveling intake screen; Contr. 5, purification works, structures; Contr. 6, filter equipment and piping; Contr. 7, furnishing, delivering pumps, $800,000. J. S. Watkins, 606-7-8 Citizens Bank Bldg., Lexington, consult. engr. Noted Feb. 15, C. D.—Feb. 21, E. N.-R.

Md., Towson—Jan. 13, by Comrs. Baltimore Co., furnishing laying 44,275 lin.ft. 6- to 12-in. c.i. watermains and appurtenances thereto in right-of-way of North Point Rd., Sparrows Point Rd. and vicinity of Edgemere, Lynch Point, Battle Grove Park and Cedar Crest. S. A. Green, Court House, ch. engr.

Mich., Detroit—Jan. 21, by E. H. Bauer, acting secy., Dpt. Water Supply, 735 Randolph St., 1,161 lin.ft. ornamental iron fence and 3 entrance gates, 1,075 ft. rein.-con. retaining wall, 3,531 ft. chain link fence with 3 strands of barbed wire and 5 gates, at Springwells Station. P.W.A. project. G. H. Fenkell, 735 Randolph St., Detroit, engr.

Mich., New Baltimore — See "Contracts Awarded."

Neb., Swanton—Jan. 16, by City, constructing c.i. pipe, bell and spigot joints, Sect. 2-3; pipe line labor, Sect. 8; and frame pump house, Sect. 9. $17,169. P.W.A. project. Hennings-son Eng. Co., Union State Bank Bldg., Omaha, engrs. Noted Nov. 1, C. D.

N. Y., Jamestown—See "Contracts Awarded."

Wash., Seattle—See "Contracts Awarded."

Wyo., Sheridan—Jan. 15, by City Council, constructing waterworks, incl. laying 2,844 lin. ft. 4- to 12-in. and relaying 2,876 ft. c.i. pipe. P.W.A. project. Bids Nov. 30, rejected. D. J. Quaid, 423 North Main St., engr. Noted Nov. 25, C. D.

Ont., London—See "Contracts Awarded."

Que., Montreal—Jan. 29, by Executive Com., City Hall, constructing river intake, supply and installation of pipes, accessories, etc. Montreal Water Bd., 3161 Joseph St., engrs. Noted Dec. 26, C. D.

CONTRACTS AWARDED

Calif., Calexico—City, water system improvement, relief labor. **W.P.A.** Pumping equipment being purchased by city as its share of cost. Total est. $23,000. R. Emerson, City Hall, clk.

Calif., Galt—F. D. Talbot, engr., Forum Bldg., Sacramento, constructing 75,000 gal. water tank, hemispherical type, 21 ft. diam., 100 ft. high, to Pittsburgh-Des Moines Steel Co., Rialto Bldg., San Francisco, $7,267; constructing water distributing system, involving 8,344 lin. ft. 6 in. and 18,000 lin.ft. 4 in. c.i. B and S pipe, 870 lin.ft. 14 in. wrought steel galvanized pipe, eight 4 in., forty-three 6 in. fire hydrants, to Underground Co., R.F.D. 1, Box 756, Berkeley, $27,550. **P.W.A.** Bids Dec. 7. Noted Dec. 17, C. D.—Nov. 14, E. N.-R.

Calif., Inglewood—City Council, furnishing, laying 8,850 lin.ft. 12 in. welded steel water pipe line from main pumping plant in Centinella Park to Reservoir, 10th Ave. and 80th Sts., to Western Pipe & Steel Co., 5717 Santa Fe Ave., Los Angeles, $13,187. Bids Dec. 17, awarded Dec. 23.

★ **Calif., Los Angeles** — Metropolitan Water Dist., F. E. Weymouth, engr., 306 West 3rd St., Schedule 6P, 5.18 mi. and Schedule 7P, 5.66 mi. 11 ft. 8 in. precast concrete pipe lines and appurtenant works for distribution system, Colorado River Aqueduct. Spec. 134, to J. F. Shea Co., Mecca, $1,107,032 and $1,-212,430 respectively. Est. $3,000,000. Bids Dec. 10, awarded Dec. 20. Noted Dec. 16, C. D. —Dec. 19, E. N.-R.

Calif., Sacramento—H. G. Denton, city clk., watermains in various sections of city, to P. J. McHugh, 363 Valencia St., San Francisco, $96,300. Est. exceeds $100,000. Bids Nov. 21. Noted Dec. 6, C. D.

Calif., San Francisco—City, Public Utilities Commissioner, City Hall, constructing valve houses and wood covering for pipe on trestle for Bay Crossing Pipe Line 2, total of 19,250 ft. of 66 in. diam. steel pipe to be covered, involving 348 MBM redwood lumber, 5,000 lb. bolts, nuts, washers and miscellaneous steel, 27,000 sq.yd. paint wood covering for pipe, install metal work furnished by city, etc., to G. Williams Co., 315 Primrose Rd., Burlingame, $35,185. Bids Nov. 29, awarded Dec. 20. Noted Dec. 10, C. D.

Calif., San Francisco — Dpt. P. Wks., City Hall, constructing four 75,000 gal. rein.-con. fire cisterns for fire protection, to Sibley Grading & Teaming Co., 165 Landers St., for City and San Francisco Co., $25,948. Est. $28,000. Bids Dec. 11, awarded Dec. 23. Noted Dec. 9, C. D.

Calif., Watsonville — City Council, improvements and replacements to water system, involving 500 lin.ft. soil-proofed 18 in. 12 ga. steel pipe, 6,175 lin.ft. 14 in. riveted steel soil proof 12 ga. pipe, 7,480 lin.ft. 16 in. steel pipe, soil proofed 12 ga. 3,670 lin.ft. 14 in. f.i. pipe, Class 100, 27,243 lin.ft. 4- to 8-in. Class 150 c.i. pipe, to Union Paving Co., Call Bldg., San Francisco, $68,577. Est. $92,174. **P.W.A.** Bids Dec. 12, awarded Dec. 16. Noted Dec. 23, C. D.—Nov. 14, E. N.-R.

Colo., Greeley—City Council, furnishing 13,-000 lin.ft. 20 in. c.i. water pipe, to Hendrie & Bolthoff Co. and Crane O'Fallon Co., Denver, at $3.47 per ft.•••manufacturing pipe, to Colorado Fuel & Iron Co., Pueblo•••pipe fittings, to Mine & Smelter Supply Co., Denver.

†**Fla., Pensacola**—Yards & Docks, Navy Dpt., Wash., D. C., relocating watermains and sanitary sewers at Naval Air Station, Pensacola, to Monk & Eley, Pensacola, $13,460.

Ga., Gainesville—City, S. C. Dunlap, mgr., waterworks improvements, to Smith Pew Constr. Co., 435 Irwin St., Atlanta, $45,853•••filter equipment, to Burford, Hall & Smith, Atlanta, $17,590•••tank, to R. D. Cole, Newnan, $20,-500. Grand total $113,943. Est. $113,000. **P.W.A.** Bids Dec. 13. Noted Dec. 9, C. D.

Ga., Gray—J. B. McCrary & Co., consult. engrs., 22 Marietta St. Bl. Atlanta, constructing well for waterworks, for City, to Gray & Stevens, Inc., 554 Forest St., Jacksonville, Fla., $2,180. **P.W.A.** Bids Nov. 8. Noted Oct. 31, C.D.

Ga., Stone Mountain—J. B. McCrary Co., engrs., 22 Marietta St., Atlanta, constructing waterworks improvements, for City, to Smith Pew Constr. Co., Atlanta, $20,523. Est. $21,-900. Bids Dec. 14. Noted Dec. 9, C. D.

Ga., Woodland—J. B. McCrary & Co., consult. engrs., 22 Marietta St. Bl., Atlanta, c/o I. L. Jordan, mayor, City Hall, drilling deep well for water supply system, for City, to Va. Machinery & Well Co., 1319 East Main St., Richmond, Va., $1,313. **P.W.A.** Bids Nov. 1. Noted Oct. 31, C.D.

Idaho, Reubens—City, pipe line replacements, new 30,000 gal. reservoir and installing fire hydrants, precaulked pipe, to A. Kester, Lewiston, $5,478. **P.W.A.** Bids Nov. 29. Noted Dec. 16, C.D.

Ind., Brazil—See "Bids Asked."

Ia., Adel — City, remodeling and enlarging waterworks, to S. E. Anderson, 1435 29th St., Des Moines, $19,675. Est. $25,000. **P.W.A.** Bids Dec. 6, awarded Dec. 9. Noted Dec. 12, C. D.—Dec. 20, E. N.-R.

Ia., Bussey—City, steel tank on tower for waterworks system, to Pittsburgh-Des Moines Steel Co., 1418 Tuttle St., Des Moines, $6,190 •••well, to McCutcheon Well Co., 4214 4th St., Des Moines, $1,019•••excavation, to C. W. Rowland, Des Moines, $8,832. Grand total $16,041. Est. $23,200. **P.W.A.** Bids Nov. 23.

Ia., Dubuque—City, 750,000 gal. steel water tank on West 3rd St. near Cody St., to Pittsburgh-Des Moines Steel Co., 1015 Tuttle St., Des Moines, $57,726. Est. $60,000. **P.W.A.** Bids Dec. 14, awarded Dec. 14.

Ia., Keystone—See "Sewerage and Waste Disposal."

Ia., North English—Town Council, erecting 60,000 gal. steel tank and tower, one 6 in. gate valve, for waterworks, to Pittsburgh-Des Moines Steel Co., 1015 Tuttle St., Des Moines, $9,219. Est. $10,000. **P.W.A.** Bids Dec. 13, awarded Dec. 13. Noted Dec. 9, C. D.

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Projects $500,000 and over symbol ★
Reports noted back to former issues are designated as follows:
C. D. Construction Daily
E. N.-R. Engineering News-Record.
Federal Government projects symbol †

◆

†*Federal Government.*

For official proposal advertising see Searchlight Section

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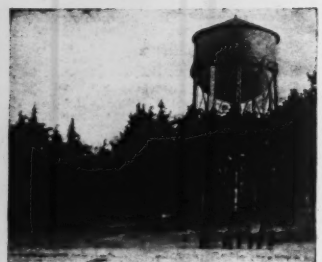

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Waterworks (Continued)

Ia., Sabula—Town, erecting 60,000 gal. tank on 100 ft. tower, 6 in. gate valve, to Pittsburgh-Des Moines Steel Co., 1015 Tuttle St., Des Moines, $7,344. Est. $8,181. **P.W.A.** Bids Dec. 14, awarded Dec. 14. Noted Dec. 9, C. D.

Ia., Titonka—Town, to Pittsburgh-Des Moines Steel Co., Tuttle St., Des Moines, watermains, etc., Sect. 1., $16,555; 50,000 gal. steel water tank, Sect. 3, $6,741; pump house, Sect. 4, $1,016***to Iowa Mchy. & Supply Co., 317 Court St., fire hose and nozzles, Sect. 2, $619 ***to Thorpe Bros. Well Co., 2340 6th St., Des Moines, drilling 8 in. well, $1,176. Grand total $26,107. **P.W.A.** Bids Dec. 2. Noted Sept. 20, C. D.—Sept. 26, E. N.-R.

Ia., Wheatland—Town Council, erecting 60,000 gal. steel water tank and tower, one 6 in. gate valve, to Pittsburgh-Des Moines Steel Co., 1015 Tuttle St., Des Moines, $6,620. Est. $7,272. **P.W.A.** Bids Dec. 13, awarded Dec. 13. Noted Dec. 9, C. D.

Massachusetts—M. McDonough Co., general contractors, Broadway, Malden, 500 tons structural steel in connection with construction of bridge over Little River, Newbury and Newburyport, to Northern Steel Co., 44 School St., Boston, for Commonwealth of Massachusetts, Dpt. P. Wks., 100 Nashua St., Boston. Noted Dec. 3.—C.D. Dec. 5, E.N.-R., under "Contracts Awarded."

Mass., Northboro—Morgan Constr. Co., general contractors, 193 Hanover St., Boston, plumbing for water filtration plant, Contr. A, to Norwood Eng. Co., Florence, for Town, c/o Bd. Selectmen, Town Hall***electrical work, to A. J. Wolfe Co., 193 Hanover St., Boston*** excavation, to D. G. Di Pietro, Mechanic St., Boston***reinforcing steel, to Barker Steel Co., 25 Water St., Somerville***structural steel and iron, to Standard Steel & Iron Wks., 16 Walnut St., Watertown. General contractor also desires prices on heating and painting. Noted Dec. 17, C. D.—Dec. 26, E. N.-R., under "Contracts Awarded."

Mass., Norwood — Town, W. C. Kendrick, mgr., Town Hall, constructing iron removal plant and appurtenant works, to Jas. A. Munroe & Sons, 159 North Washington St., North Attleboro, $105,350. **P.W.A.** Bids Dec. 2, awarded Dec. 24. Noted Dec. 9, C. D.—Nov. 28, E. N.-R.

Mass., Pittsfield—City, A. B. Farnham, comr., P. Wks., City Hall, rein.-con. dam and earthen reservoir, to Lindholm Contr. Co., Jefferson St., $199,995. **P.W.A.** Bids Dec. 9, awarded Dec. 19. Noted Dec. 17, C. D.—Dec. 5, E. N.-R.

Mass., Sudbury — C. Repucci & Co., general contractors, 10 Garden Court, Boston, furnishing 700 tons 12 in. c.i. pipe for watermains to be laid in village, to U. S. Pipe & Fdry Co., Burlington, N. J., for Town, J. H. Powers, chn. Bd., Water Comrs. Noted Dec. 11, C. D. and Dec. 19, E. N.-R., under "Contracts Awarded."

Mich., Ishpeming—F. E. Kreese, chn. Bd. P. Wks., furnishing, installing 35,000 ft. 6- to 14-in. Class A c.i. pipe in 6 ft. lengths, together with accessories, to L. W. Brumm, Marquette, $133,541. Bids Dec. 3. Noted Nov. 20, C. D. —Nov. 28, E. N.-R.

Mich., Muskegon—City, constructing concrete substructure for filtration plant, to H. G. Christman, Lansing, $205,550. Bids Dec. 12. Noted Dec. 9, C. D.

Mich., New Baltimore—City, rapid sand filter type water filtration plant, to filter water from Anchor Bay. W.P.A. labor under supervision of Francis Eng. Co., engrs., Eddy Bldg., Saginaw. $20,000.

Minn., Northfield—Bd. Educ., general contract 2 story, basement, rein.-con., brick, cut-stone school addition, to Standard Constr. Co., 215 South 6th St., Minneapolis, $91,689. **P.W.A.** Bids Dec. 14. Noted Dec. 9, C. D.—Oct. 31, E. N.-R.

Miss., Inverness—Mayor, constructing artesian well 6 in. in diam., and laying 1,800 lin.ft. pipe for distribution system, to Gray Artesian Well Co., Pensacola, Fla., $7,173. Est. $7,800. Bids Nov. 14, awarded Dec. 16. **P.W.A.** Noted Nov. 7, C. D.—Sept. 26, E. N.-R.

Miss., Lexington—Mayor and Bd. Aldermen, drilling 1 artesian well for water supply, to Layne-Central Co., Chelsea Ave., Memphis, Tenn., $5,990. **P.W.A.** Bids Dec. 5. Noted Nov. 25, C.D.—Nov. 28, E.N.-R.

Neb., Clarks—City, tank and towers, pipe and pipe line labor for waterworks, to Omaha Steel Wks., 48th and Leavenworth Sts., Omaha, $6,390. Est. $7,273. **P.W.A.** Bids Nov. 12. Noted Oct. 31, C. D.—Nov. 7, E. N.-R.

Neb., Prague—City, repairing and constructing standpipe additions, to Drake-Williams-Mount Co., 23rd and Hickory St., Omaha, $1,325. Total est. $15,466. **P.W.A.** Bids Dec. 13. Noted Dec. 6, C.D.

N. J., Newfield — Boro, constructing water distribution system, to A. Stanley Mundy & Co., 52 Main St., Woodbridge, $32,735. **P.W.A.** Remington & Goff, 509 Cooper St., Camden, engrs.

N. M., Springer—City, constructing pipe line, reconstructing filter plant, installing chlorinator, to Schwartz Constr. Co., Earhart Blk., Colorado Springs, Colo., $25,383. Est. $30,000. **P.W.A.** Bids Nov. 30. A. A. Weiland, 503 Court St., Pueblo, Colo., engr.

N. Y., Brooklyn—Dpt. Water Supply, Gas & Electricity, Municipal Bldg., New York, constructing high pressure fire pumping station, at Neptune Ave. and West 23rd St., to W[illegible] Constr. Co., 210 East 31st St., New [illegible] $168,950***heating to Dierks Heating [illegible] 210 East 31st St., New York, $5,697*** ing, to G. E. Horn, 454 East 84th St., $ Grand total $178,120. Bids Nov. 29. Noted Dec. 2, C. D.—Nov. 21, E. N.-R.

N. Y., Jamestown — City, constructing [illegible] watermains in Murray Ave., Kipp, J[illegible] Falconer, Partridge, Dexter, Philips Sts [illegible] labor and own forces. $15,798. C. O. [illegible] son, supt. Noted Nov. 21, C. D.—Nov. [illegible] E. N.-R.

N. Y., Long Island City—Dpt. Water Supply Gas & Electricity, Municipal Bldg., New York, concrete pile and timber support under watermains crossing Thurston, Droyers and Hook Creek Canal, Rockaway Blvd., to H. Johnson, 142-05 Holly Ave., Flushing, $6,965. Bids Dec. 9. Noted Dec. 10, C. D.—Dec. 5, E. N.-R.

N. Y., Oswego—City, elevated tank for waterworks, Contr. B, near Minetto, to Chicago Bridge & Iron Wks., 165 Bway., New York, $1,700. **P.W.A.** Bids Dec. 12. Noted Dec. 11, C. D.

N. Y., St. George—Dpt. Water Supply, Gas & Electricity, Municipal Bldg., New York, air conditioning, hauling and setting 36 in. check valve and appurtenances on Syphon 2, near Bay St. and Vanderbilt Ave., Richmond Boro, to DeMicco Contg. Co., 1567 Yates Ave., New York, $3,250. Bids Dec. 16. Noted Dec. 17, C. D.—Dec. 12, E. N.-R.

O., Bellevue—City, constructing water filtration plant and gravity supply line, to Lowensohn Constr. Co., 1740 East 12th St., Cleveland, $162,778 and $73,856 respectively*** watermains, to S. Trifoletti, 1518 East Oberlin Ave., Lorain, $12,093. Grand total $248,727. **P.W.A.** Bids Dec. 10, awarded Dec. 20. Noted Dec. 19, C. D.

O., College Corner — City, constructing distribution system, pump house, etc., to Ostrum Realty & Contg. Co., 625 Peoples Bank Bldg., Indianapolis, Ind., $27,360***elevated tank, to Chicago Bridge & Iron Wks., 37 West Vanderbilt Ave., Chicago, Ill., $7,900***wells, to Layne-Northern Co., 3712 Brill Rd., Indianapolis, Ind., $1,680. Grand total $36,940. Est. $43,000. **P.W.A.** W. S. Heer Eng. Co., Terre Haute, Ind., engrs. Noted Nov. 18, C. D.

O., Shiloh—Village, elevated tank 100 ft. high, to Chicago Bridge & Iron Wks., Rockefeller Bldg., Cleveland, 6,000 ft. 4- to 8-in. water lines, to P. E. Bickle, Jeromeville. **P.W.A.** North Central Ohio Eng. Co., Richland Trust Bldg., engrs. Noted Oct. 21, C.D.—Oct. 24, E.N.-R.

Okla., Ardmore—City, water filtration plant, to C. S. Clark, Petroleum Bldg., Oklahoma City, $42,500. Est. $50,000. **P.W.A.** Awarded Dec. 15. W. R. Holway, Tulsa, engr.

Okla., Elk City — City, constructing water wells, pumps and force main, to Sherman Iron Wks., 18 East Main St., Oklahoma City, $314,091. Est. $325,000. **P.W.A.** Bids Dec. 4. Noted Nov. 20, C. D.

Okla., El Reno—City, 1,500 g.p.m. centrifugal pump, gasoline engine, 18x14 ft. pump house, 8,784 ft. 4 and 12 in. watermains and hydrants, to Asplund Constr. Co., Enid, $31,965; est. $33,000; 500,000 gal. elevated water tank and tower, to Chicago Bridge & Iron Wks., 37 West Van Buren St., Chicago, Ill., $29,440 est. $30,000. **P.W.A.** Bids Dec. 13. A. Sawillisch, El Reno, engr.

Okla., Fairfax—City, constructing new impounding reservoir, water supply, dam, pipe line, valves, and fencing, to Sherman Iron Wks., 18 East Main St., Oklahoma City, $93,085. Est. $100,000. **P.W.A.** Awarded Dec. 12. Noted July 1, C. D.—July 4, E. N.-R.

Okla., Hennessey—City, watermain extensions, new drilled well, pump, motor, valves and hydrants, to Asplund Constr. Co., Enid, $16,180. Est. $18,000. **P.W.A.** Bids Dec. 2, awarded Dec. 13. Noted Dec. 21, C. D.

Ore., Amity—City, new waterworks system, to J. C. Compton, McMinnville, $20,963. Bids Dec. 16. Baar & Cunningham, Spaulding Bldg., Portland, engrs.

Tex., Pecan Gap — City, c/o H. T. Shipman, mayor, complete waterworks system, incl. pumphouse, pumping equipment, storage tank and distribution system, to W. B. Carter, Wichita, $32,063. Est. $31,500. **P.W.A.** Bids Dec. 10. Noted Dec. 5, C. D.—Sept. 5, E. N.-R.

Tex., Poth — City, c/o W. Eckel, mayor, waterworks improvements, incl. distribution system, involving 22,000 lin.ft. 6- to 12-in. c.i. pipe, new deep well, cased and ready for pump, electric pumper, fire plugs, etc., distribution system, to A. E. Rheiner & Co., c/o Builders Exch. Bldg., San Antonio, $19,872. well, to I. L. Dingham, San Antonio, $7,104. Est. $33,000. **P.W.A.** Bids Dec. 4, awarded Dec. 19. Noted Nov. 26, C. D. — Oct. 10, E. N.-R.

Tex., Taylor—City, W. Davis, mayor, waterworks improvements, incl. 400,000 gal. steel storage tank on 75 ft. steel tower, various distributing lines, rock rip rap wall, etc., to Pittsburgh-Des Moines Steel Co., Neville Island, Pittsburgh, Pa., $32,843. **P.W.A.** Bids Dec. 9. Noted Dec. 5, C. D.—Aug. 29, E. N.-R.

Tex., Toyah — City, waterworks, incl. distributing system, pumping unit, tank and tower, etc., to McCall Eng. Co., Waco, $22,000. Est. $26,000. **P.W.A.** Awarded Dec. 16. J. E. Ward, Harvey-Snider Bldg., Wichita Falls, engr.

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†*Federal Government.*

Waterworks (Continued)

Utah, Millville—Town, 4- to 6-in. c.i. pipe, valves, hydrants and fittings, to Waterworks Equipment Co., 149 West 2nd St., Salt Lake City, $12,000***labor, to G. Studder, Logan, $10,300. Est. $25,454. **P.W.A.** Bids Nov. 19. Noted Nov. 6, C. D.—Nov. 14, E. N.-R.

Utah, Nibley—Town, furnishing 3- to 6-in. c.i. pipe, valves, hydrants and fittings, to Waterworks Equipment Co., 149 West 2nd St. S., Salt Lake City, $19,100; installing system by force account. Total est. $29,000. **P.W.A.** Bids Oct. 19. Noted Nov. 6, C. D.

Utah, Plymouth—Town Bd., c.i. distributing system, to replace wood pipe system, materials, to Waterworks Equipment Co., 149 West 2nd South St., Salt Lake City, $8,116; labor, to Neils Fugal, Pleasant Grove, about $7,000. Est. $15,000. **P.W.A.** Bids Dec. 14. Noted Nov. 8, C. D.—Nov. 14, E. N.-R.

Wash., Brewster—City, furnishing, installing 14,800 ft. 6 in. pipe, rein.-con. pump house, curbing, deepening existing gravity supply well, to Columbia Concrete Pipe, 9th and Walla Walla Aves., Wenatchee, $10,518. Bids Dec. 7. Noted Apr. 9, C. D.—Apr. 11, E. N.-R.

Wash., Everson—City, building pump house and installing mains and service connections, to Wilder & Montford, Blaine, $12,000; 50,000 gal. steel reservoir tank, to Seattle Boiler Wks., 1132 West 45th St., Seattle, $6,000. Est. $15,735. **P.W.A.** Noted Nov. 29, C. D.

Wash., Seattle—King Co. Water Dist. 3, W. H. Harris, secy., Empire Bldg., water distribution line, W.P.A. labor. $20,000. Will call bids for material if district votes at January election in favor of bond issue. N. Aull, 1839 McGilvra Blvd., engr.

Wash., Union Gap—City, digging two wells, to A. A. Durand, 560 University Ave., Walla Walla, $2,890. **P.W.A.** Noted Dec. 18, C. D.

Wyo., Sundance—Town, improving waterworks and extensions and replacements to distribution system, to Northwestern Eng. Co., Rapid City, S. D., $31,680. Est. $36,364. P.W.A. Bids Dec. 9. D. A. Cale, Sundance, engr.

Ont., **London**—P. Utilities Comn., constructing 20x30 ft., brick pump house building, equipment, incl. 4 m.g. pump at new East London Reservoir, day labor under supervision Comn. $19,000.

SEWERAGE AND WASTE DISPOSAL

PROPOSED WORK

Calif., Decoto—City plans sanitary sewerage system and sewage treatment plant. To exceed $25,000. J. A. Mancini, 774 Pinedale St., Hayward, engr.

Calif., El Monte—City soon takes bids sanitary sewage disposal plant. $68,000. P.W.A. provided $30,600 to assist in financing project. Currie Eng. Co., Anderson Bldg., San Bernardino, engrs. Noted Aug. 7, C. D.—Aug. 15, E. N.-R.

★ **Calif., San Francisco**—City, completing plans for sewage disposal plant, $500,000 (P.W.A.) to accommodate sewage from districts west of Twin Peaks in Golden Gate Park. Rights-of-Way for Richmond sewer tunnel, at $350,000 unit of P.W.A. have been acquired and early construction contemplated. J. J. Casey, city engr., requested Municipal Park Comn. to approve plans for $100,000 pumping station and discharge line to be constructed to purify San Francisco Bay waters at Aquatic Park and Yacht Harbor.

Colo., Colorado Springs—City soon takes bids constructing sanitary sewerage system. Bids postponed from Dec. 11. B. Lowther, Colorado Bldg., Denver, engr. Noted Nov. 25, C. D.

Mich., Lansing—City making plans vitr. and concrete trunk sewerage system to serve northeastern section of Lansing and Lyons and Weldon Aves., Cedar, Herbert, Baker Sts. sewer systems, brick and concrete manholes. $289,214. P.W.A. project. S. C. Jacka, city engr.

Minn., Fergus Falls—City rejected bids Dec. 27, constructing sewage disposal plant, interceptor sewers and 2,000 lin.ft. tunnel work. $161,000. P.W.A. project. Pillsbury Eng. Co., 1200 2nd St. S., Minneapolis, engrs. Will readvertise. Noted Dec. 19, C. D.—Nov. 21, E. N.-R.

N. Y., Celoron—Village plans 4,449 lin.ft. 8- to 12-in. storm sewers in 7 streets. $23,000. **Maturity early in 1936.** May seek Federal funds to finance.

N. Y., Dickinson—City plans constructing storm sewer to carry sewerage into C.F.J. Pond in Johnson City. $50,000. Town of Dickinson, Village of Johnson City and City of Binghamton, will finance. J. A. Giles, Binghamton, and J. C. Adams, Johnson City, engrs.

N. Y., Irvington—Bd. City Trustees plans constructing incinerator plant. To exceed $17,750.

N. Y., Lockport—State Public Wks. Administration disapproved award for constructing municipal sewage disposal plant. Noted Dec. 30, C. D.—Jan. 2, E. N.-R., under "Contracts Awarded."

O., Woodville—City making plans combined sanitary and storm sewer in Victoria Heights. $20,000. A. Blake, city engr. W.P.A. project.

★ **R. I., Pawtucket**—Blackstone Valley Sewage Comn., making plans sewage disposal plant and sewer lines to take care of city of Pawtucket, towns of Central Falls, Lincoln and Cumberland. Application made to P.W.A. for $4,075,000 loan and grant. T. E. Harding, City Hall, city engr.

Wash., Dayton—Town plans sewage disposal system. P.W.A. project. Stevens & Koon, Spaulding Bldg., Portland, Ore., engrs.

★ **Wash., Spokane**—City plans laying 237,000 ft. sewer pipe. $958,874. W.P.A. to provide part of funds. A. D. Butler, City Hall, engr. Noted Nov. 28, C. D.—Dec. 5, E. N.-R.

Sask., Moose Jaw—City making plans constructing sewage disposal plant. $100,000. H. C. Ritchie, city engr.

BIDS ASKED

Ind., Lawrenceburg—Jan. 15, by City, H. B. Herrick, city clk., constructing sewage disposal plant with equipment, accessories, pump station, sludge storage, sludge drying beds with glass cover, sprinkling filter, pumping equipment, heating equipment, piping. P.W.A. project. C. Brossman, Indianapolis, consult. engr.

Ind., Muncie—See "Contracts Awarded."

★ **Minn., St. Paul**—Minneapolis-St. Paul Sanitary Dist., M. Rosen, secy., 1923 University Ave., bids about May 1, constructing 4 rein.-con., brick sewage disposal buildings, with filtering and purifying equipment. Pig's Eye Island, $3,400,000; also bids about latter part of January, 3,960 lin.ft. concrete lined tunnel, 11 ft. 9.5 in. in diam. from Griggs and St. Anthony Aves. to Victoria and St. Anthony. Job 410. P.W.A. project. C. C. Wilbur, ch. engr.

N. Y., Buffalo—Jan. 14, by City, test borings for sewage disposal plant, $60,000. P.W.A. and W.P.A. project. Greeley & Hansen 6 North Michigan Ave., Chicago, Ill., engrs. Noted Aug. 13, 1934, C. D. and Aug. 16, 1934, E. N.-R.

Pa., Farrell—City, bids about Jan. 15, constructing sewers, sewage pumping station and sewage treatment plant. $100,000. P.W.A. project. Bids Dec. 12 rejected. R. H. Craig, 222 North 3rd St., Harrisburg, engr. Noted Nov. 29, C. D.—Dec. 5, E. N.-R.

Pa., Jeannette—Borough, bids about Jan. 15, sewers, sewage pumping station and sewage treatment plant. $205,455. P.W.A. project. Bids Dec. 13 rejected. Robert Hall Craig, 222 North 3rd St., Harrisburg, engr. Noted Dec. 6, C. D.—Oct. 31, E. N.-R.

Pa., Pittsburgh—Jan. 13, by S. L. Card, secy., Ambridge Boro Council, 8th St. Sewerage System, requiring 23,450 cu.yd. excav., 427 ft. 84 in., 877 ft. 72 in., 445 ft. 66 in., concrete masonry, 391 ft. 60 in. concrete masonry pipe, 924 ft. 48 in., 935 ft. 42 in., 50 ft. 30 in. and 375 ft. 30 in. precast concrete pipe, 2,300 ft. 15 in.t.c. pipe, 17 offset manholes, 222 Standard manholes, 30 inlets, etc. $194,545. P.W.A. project. A. W. Johns, Ambridge, engr.

LOW BIDDERS

★ **N. Y., New York**—Dpt. Sanitation, 125 Worth St., New York, Jan. 6, constructing Bronx Intercepting Sewers from East 138th St. to Jerome Ave., Sect. 3, Contr. 12, Wards Island Sewage Disposal Plant, alternate bids open cut or trench method from National Excavator Corp., 295 Madison Ave., 4a and 5a $1,704,930***from Rodgers & Haggerty, Inc., 500 5th Ave., 4b-5b $1,451,620; 4a and 5b $1,618,120; and 4b and 5a $1,582,095. Noted Dec. 30, C. D.—Jan. 2, E. N.-R.

CONTRACTS AWARDED

†**Calif., San Diego**—Yards & Docks, Navy Dpt., Wash., D. C., constructing outfall sewer, to H. H. Petersen, 3788 Atlantic St., $12,800.

Calif., San Francisco—Dpt. P. Wks. City Hall, constructing 3,152 ft. 2 in. compartment, 8 ft. 6 in. x 11 ft. and 182 ft. 3 x 4 ft. sewers, to Healy-Tibbitts Constr. Co., 64 Pine St., $334,260. Est. $415,000. **P.W.A.** Bids Dec. 6, awarded Dec. 19. Noted Dec. 19, C. D.

★ **Ill., Oak Park**—City, constructing Oak Park Intercepting Sewer, tunnel section south division Contr. A, and open cut section north division Contr. D, to M. Pntarelli, 4248 North Kilpatrick Ave., Chicago, $728,489 and $269,164 respectively***tunnel section, north division, Contr. B, to S. A. Healy Constr. Co., 600 West Van Buren St., Chicago, $476,052*** open cut section, south division, Contr. C, to John Marsch, Inc., 1307 Wrightwood Ave., Chicago, $321,961. Grand total $1,849,666. **P.W.A.** Bids Dec. 9. Noted Dec. 5, C. D.

Ind., Franklin—Bd. P. Wks., City Hall, sewage disposal plant, to Buesching Bros. Constr. Co., 1611 Randalia St., $60,161. **P.W.A.** Bids Dec. 6. Noted Nov. 25, C. D.—Nov. 28, E. N.-R.

Ind., Kokomo—Bd. P. Wks., City Hall, constructin gsewage disposal plant, to F. K. Vaughn & Son, Hamilton, O., $226,606. **P.W.A.** Bids Dec. 19. Noted Dec. 3, C. D.—Dec. 5, E. N.-R.

Ind., Muncie—City, constructing intercepting sewer, by W.P.A. labor. $340,178.

Ia., Collins—Town, sewage disposal plant, to Hoak Constr. Co., 612 63rd St., Des Moines, $25,300. Est. $30,000. **P.W.A.** Bids Dec. 14.

Ia., Keystone—City, sewerage system, to D. Christensen, Cedar Rapids, $13,500; water extensions, to Hoak Constr. Co., 612 63rd St., Des Moines, $5,882. Est. $48,000. **P.W.A.** Bids Dec. 9.

Ia., Osceola—City, constructing sewage disposal plant, to McKee & Fancher Constr. Co.,

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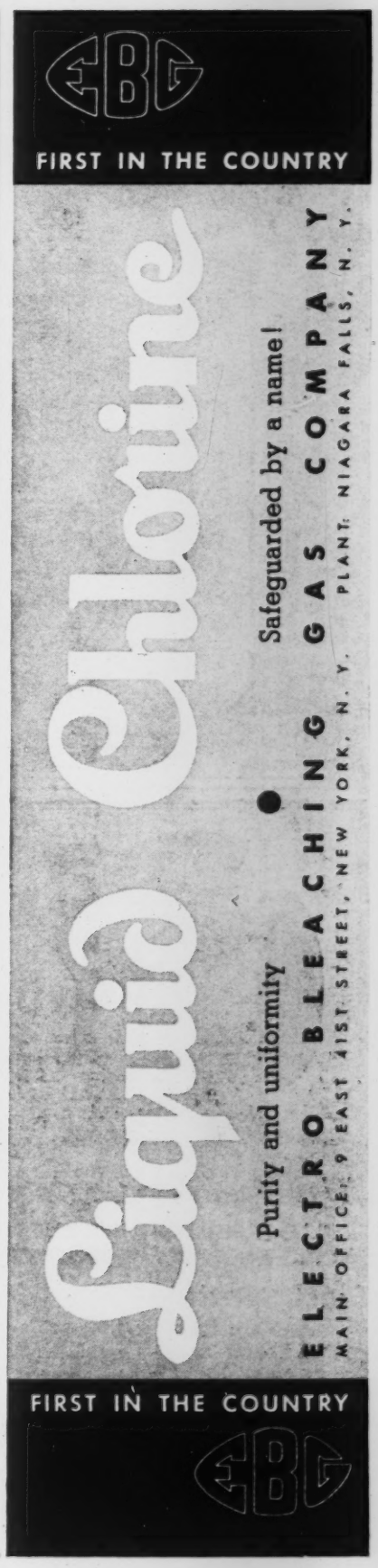
†*Federal Government.*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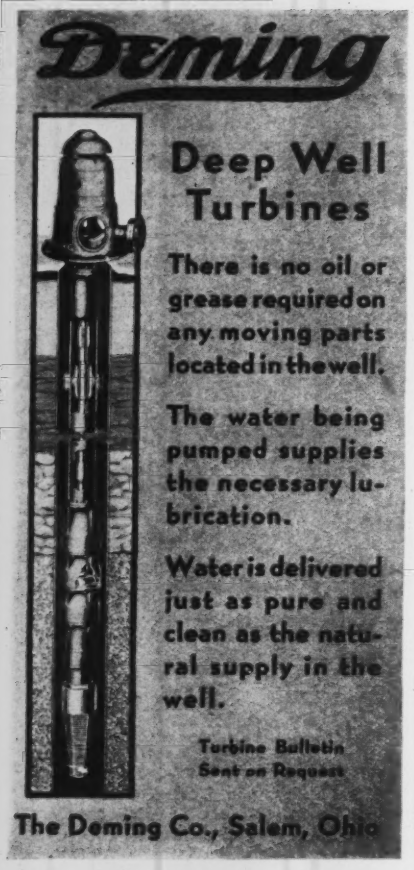
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Sewerage, etc. (Continued)

trustees, Oskaloosa, $36,989. **P.W.A.** Bids Dec. 5.

Ia., Rockwell—Town, sewage disposal plant and sewerage system, to Star Building Co., Cedar Rapids, $47,846. Est. $60,000. **P.W.A.** Bids Dec. 7.

Ia., Sigourney—City, sewage disposal plant, to G. Gordan & Son, Centerville, $29,399. Est. $33,000. **P.W.A.** Bids Dec. 14.

Md., Frederick—City, constructing 52,000 lin. ft. 8- to 15-in. sewers and 33,000 lin. ft. house connections, to Ligon & Ligon, 3310 Ridgewood Ave., Baltimore. P.W.A. Nov. 29, C. D.—Dec. 5, E. N.-R.

Mass. Chicopee—City, furnishing, installing 72 in. rein.-con. precast pipe sewer with manholes and outfall, to R. Civitarese, 139 Providence St., Hyde Park, Boston, $35,000. **P.W.A.** Bids Nov. 15, awarded Dec. 18. Noted Nov. 22, C. D.—Nov. E. N.-R.

Mass., Newton—City, C. A. Mahoney, street Comr., City Hall, constructing Oak Hill Sewer to V. Barletta Co., 8 Whipple Ave., Jamaica Plain, Boston, $220,923. **P.W.A.** Bids Nov. 29, awarded Dec. 17. Noted Dec. 10, C. D.—Oct. 24, E. N.-R.

Mass., Pittsfield—City, A. B. Farnham, comr. P. Wks., City Hall, constructing addition to sewage treatment plant, to A. D. Daddario, 15 Agnes St., Hyde Park, Boston, $224,606. Bids Dec. 6. **P.W.A.** Noted Dec. 17, C. D.

Mass., Salem—Simpson Bros. Corp., general contractors, 193 Hanover St., Boston, excavation contract in connection with construction of grease and grit chamber, sewage disposal project, for South Essex Sewerage Bd., to Thos. Mackey & Sons, 468 Lafayette St.•••drilling and blasting, to M. J. Gates, Washington St., Malden•••furnishing machinery and appurtenances, to Starkweather Eng. Co., Inc., 79 Milk St., Boston. Noted Nov. 22, C. D.—Nov. 28, E. N.-R., under "Contracts Awarded."

Mass., South Deerfield — Town, furnishing, laying 8- to 12-in. sanitary sewers, to Kelleher Corp., Turners Falls, $179,906. **P.W.A.** Bids Nov. 27. Noted Nov. 22, C. D.—Nov. 21, E. N.-R.

Mich., Grand Haven—J. N. Poel, city clk., constructing Sects. A and B, 2,550 ft. 15- to 27-in. sewer, 3,700 ft. 27 and 24 in. sewer, to United Constr. Co., Grand Rapids, $25,073 and $35,417 respectively; Contr. C, 6,480 ft. 18- to 27-in. sewer, to G. Pontorelli, $41,603. **P.W.A.** Bids Dec. 11. Noted Dec. 6, C. D.—Nov. 14, E. N.-R.

Miss., Hernando—S. W. Eason, town clk., sanitary sewerage system, to E. M. Farris, Athens, Tenn., $56,038. Est. $69,000. **P.W.A.** Bids Dec. 12.

N. J., Cape May—City, constructing sewer and storm repair, to Versaggi Bros., 301 East 15th St. N.W., Wildwood, $27,080. **P.W.A.** Noted Nov. 27, C. D.—Dec. 5, E. N.-R.

N. J., Pitman—Boro, reconstructing sewage treatment plant, to T. Proctor Co., Inc., 218 5th Ave., Long Branch, $28,000. **P.W.A.** Noted Dec. 19, C. D.—Dec. 26, E. N.-R.

★ **N. Y., Syracuse**—Bd. Supervs. Onondaga Co., Court House, transforming Ley Creek into closed sewer and constructing sewage disposal plant at Onondaga Lake, own forces, under supervision of R. A. Traver Co., superv. **W.P.A.** project. $1,600 000 allotted and county to appropriate $400,000. Total est. $2,000,000. **Noted July 2, C. D.—July 11, E. N.-R.**

†**North Carolina**—National Park Service, Dpt. Interior, Wash., D. C., sewage disposal plant and water system, in Great Smoky Mountain, to G. M. Ferris, Athens, Ga., $48,549.

★ **O., Akron** — City, constructing sanitary sewers, Ellet Dist. 2 and sanitary sewers in Dan St., to Shullo Constr. Co., $25,836 and $58,064 respectively est. $25,877 and $59,555 respectively•••brick sewer in South St. and sanitary sewers in Weston Rd., to B. F. Perry, 106 North Main St., $125,726 and $28,752 respectively est. $125,000 and $34,211 respectively•••storm water sewer in Carroll St., to Fornaro Constr. Co., Scofield Bldg., Cleveland, $84,642 est. $90,000•••sanitary sewers in Louisiana and Harpster Sts., to A. S. Helbig Co., 119 Conger Ave., $33,181 est. $34,804••• in East Market St., to Middlewest Constr. Co., Cleveland, $171,952 est. $176,130•••interceptor sewer in Northside Dist., to Lombardo Bros. Co., 3039 Orange St., Cleveland, $122,069 est. $125,000. Grand total $650,222. **P.W.A.** Noted Nov. 18, C. D.

O., Berea—City, constructing 1 mg. activated sewage disposal plant, to Loesch & Green Constr. Co., 4311 West 32nd St., Cleveland, $115,315. **P.W.A.** Noted Dec. 30, C. D.—Jan. 2, E. N.-R.

O., Canal Winchester—City, sewerage system, to Kohbarger Constr. Co., Edison, about $40,000; pumping plant, to K. B. Stover, Fincastle, Va., about $13,000. Noted Oct. 31, C. D.—Nov. 7, E. N.-R.

O., Georgetown — City, constructing sewage disposal plant, to L. C. Love, 868 Crescent Drive, Sidney, $27,630•••33,290 ft. 6- to 12-in. vitr. clay sanitary sewers, to Nickles Bros. & J. Pandoli, Canton, $44,758. Est. $85,000. **P.W.A.** Noted Dec. 27, C. D.—Jan. 2, E. N.-R.

O., Mansfield—City, 4½ m.g. activated sewage disposal plant, pumping equipment and sewer lines, to Lowensohn Constr. Co., 1740 East 12th St., Cleveland, $205,000. **P.W.A.** Noted Dec. 31, C. D.—Jan. 9, E. N.-R.

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O., Wilmington—City, Contr. 1, consisting of sanitary sewer and pumping station, also 11,220 ft. 8 in. vitr. clay pipe, sanitary sewer, pumping station and appurtenances, to W. H. Crawford & Son, Wilmington, $25,485. Est. $25,000 plus. **P.W.A.** Noted Dec. 23, C. D.—Dec. 26, E. N.-R.

Tex., Kingsville—City, c/o J. C. Nolan, mayor, sewer extension and disposal plant, incl. pump house, pumping equipment, transmission line, etc., to Chamberlain & Strain, Natl. Bank of Commerce Bldg., San Antonio, $35,924. Est. $39,000. **P.W.A.** Bids Dec. 7, Noted Dec. 17, C. D.—Oct. 24, E. N.-R.

Tex, Muleshoe—Mayor and City Comn., constructing collecting sewerage system, outfall sewer line to disposal plant, etc., to Panhandle Constr. Co. Lubbock, $30,490. **P.W.A.** Bids Nov. 26. Noted Dec. 12, C. D.—Nov. 14, E. N.-R.

Tex., Pearsall—City, c/o J. Duke, mayor, constructing sanitary sewerage system, incl. complete collecting system, sewage treatment plant, etc., to Walsh & Burney, 928 North Flores St., San Antonio, $60,382. **P.W.A.** Bids Dec. 4. Noted Dec. 17, C. D.—Sept. 26, E. N.-R.

Wis., Green Bay — Metropolitan Sewerage Dist., constructing intercepting sewers, Sect. A, to Nolan Constr. Co., 14101 Plymouth St., Detroit, Mich., $322,493; and Sect. B, to United Constr. Co., Green Bay, $130,779. Bids Dec. 4. **P.W.A.** Noted Nov. 29, C. D.

Wis., Wauwatosa—City, constructing storm sewer in West Wright St. and North Ave., to Werner Co., 2455 North 68th St., $15,763 and $20,156 respectively. **P.W.A.** Bids Dec. 20.

Wis., West Bend — City, sewage treatment plant, to P. Nogtegoal, 2422 West McKinley Ave., Milwaukee, $75,231•••chlorinator, to Lakeside Eng. Co., 222 West Adams St., Chicago, Ill., $1,896•••floating cover and distributor, to Pacific Flush Tank Co., 4241 North Ravenswood Ave., $4,606 and $918 respectively •••sludge conveyor equipment, to Link Belt Co., 300 West Pershing Rd., Chicago, Ill., $6,198•••centrifugal pump, to Worthington Pump & Mchy. Co., 400 West Madison St., Chicago, Ill., $918•••plunger pumps, to Yeomans Bros. Co., 1433 North Dayton St., Chicago, Ill., $462. Grand total $91,406. **P.W.A.** Bids Dec. 6. Noted Nov. 27, C. D.

Wis., Sheboygan — City, constructing intercepting sewers, to United Constr. Co., Green Bay, $174,581. **P.W.A.** Bids Dec. 27. Noted Dec. 19, C. D.

Wash., Yakima—City, extending sewerage system at site of disposal plant, incl. 3,830 ft. 48 in. concrete pipe, to Yakima Cement Products, Yakima, $23,704. Bids Dec. 24, awarded Dec. 28. Stevens & Koon, Spaulding Bldg., Portland, Ore., engrs.

BRIDGES AND GRADE CROSSINGS

PROPOSED WORK

California—State Hy. Comn., Sacramento, rejected bids Dec. 9, borings at site of proposed combination hy. and railroad bridge over Pit River (a $3,500,000 unit), funds for which are included in initial allotment to Central Valleys Project. Will readvertise. Noted Dec. 17, C. D.

★ **Nebraska and Iowa**—Burt Co. Bridge Comn., Tekamah, Neb., plans constructing bridge over Missouri River between Decatur, Neb., and Onawa, Ia. $900,000. Applied for P.W.A. loan. Ash, Howard, Tammen & Needle, 1012 Baltimore St., Kansas City, Mo., engrs.

N. J., Belmar — Monmouth Co., Freehold, making plans bridge over Shark River between Avon and Belmar, $316,000. P.W.A. grant of $142,000, County $174,000. Ash, Howard & Needles, 111 8th Ave., New York. Noted Dec. 11, C. D.—Dec. 19, E. N.-R.

N. J., Bordentown—State Hy. Dpt., Trenton, plans widening, extending steel, concrete bridge over Black Creek, Burlington Co. $40,000.

N. J., Freehold—Monmouth Co. plans constructing new bridge between Avon and Belmar, $316,364. P.W.A. project. J. P. Hogan, Court House, Freehold, engr.

New York—Dpt. P. Wks., Albany, plans constructing steel girder bridges on Highway 5436, between McGrawville and Solon, and on Highway 737, between Truxton and Cortland, Cortland Co. G. Pinck, Weighlock Bldg., Syracuse, engr.

N. Y., Newark—New York Central R.R. Co., J. W. Pfau, ch. engr., 466 Lexington Ave., New York, soon takes bids constructing steel structure with concrete abutments for eliminating North Main St. and Mud Mill Rd. grade crossings. $200,000.

★ **New York**—Lake Champlain Bridge Comn., c/o Dpt. P. Wks., Albany, plans constructing toll bridge over Lake Champlain, from Rouses Point, N. Y. to Alburg, Vt. $700,000. $362,250 allotted by P.W.A. Fay, Spofford & Thorndike, 44 School St., Boston, Mass., engrs. Noted Dec. 31, C. D.—Mar. 28, E. N.-R.

★ **N. Y., Brooklyn**—Marine Parkway Authority, Dpt. Parks, Arsenal Bldg., Central Park, New York, revised plans vertical lift highway bridge over Rockaway inlet approved by War Dpt. Madigan-Hyland, 521 5th Ave., New York, consult. engrs. $6,000,000 bonds sold

†*Federal Government*

Bridges, etc. (Continued)

for bridge, roads, parking space and other park facilities.

N. Y., Gibsonville—Bd. Supervs. Livingston Co., Mount Morris, constructing bridge over Silver Creek. $43,000. Work started under supervision of Genesee State Parks Comn.

Texas — State Hy. Comn., H. Hines, chn., Austin, plans completed and soon takes bids Missouri, Kansas & Texas R. R. underpass and approaches, Hy. 95, WPGH 40, Part 2, Bell Co.; steel, concrete. M. K. & T. R.R. underpass and approaches, Hy. 2, WPGH 128-B, Montague Co.; steel, concrete I.&G.N. R. R. underpass and approaches on Hy. 21, WPGM 254-C, Houston Co.; P.&S.F. R. R. overpass and approaches on Hy. 15, Scurry Co.; F.W.&D.C. R. R. underpass and approaches, Hy. 2, WPGH 66-A, Part 1, Montague Co.; I.&G.N. R. R. underpass and approaches near Milano, on Hy. 36, WPGH 222, Milam Co.; T.&N.O. R. R. overpass and approaches, Hy. 34, WPGH 385-E, Ellis Co.; S.P. R. R. and Missouri Pacific R. R. underpasses, etc., Hys. 9 and 12, WPGH 572-C and D, San Antonio Co.; P.&S.F. R. R. overpass and approaches, Hy. 15, WPGH 827, Fisher Co.; I.G.&N. R. R. overpass and approaches, etc., Hy. 2, WPGH 273-A, Frio Co., $100,000; T.&N.O. R.R. underpass, approaches, etc., Memorial Park in Houston, WPGM 850-A, Harris Co., $60,000; G.C.&S.F. R.R. underpass and approaches, etc., Hy. 7, WPGH 194, Part 2, Coleman Co., $48,000; I.&G.N. R. R. underpass and approaches, etc., Enfield Rd., WPGM 828, Texas Co., $57,000. New P.W.A. project.

Texas — State Hy. Comn., H. Hines, chn., Austin, soon takes bids constructing T. and N. O. R.R. underpass and approaches in Caldwell, Hy. 3, WPGM 628 D, Burleson Co.

★ **Tex., Dilley**—Frio Co. (Pearsall) and State, preliminary plans and surveys long reinforcing steel vehicular bridge over Leon and Frio Rivers, 6 mi. north of here. $500,000. J. G. Rollins, Travis Bldg., San Antonio, resident engr.

Tex., Fisher—Fisher Co. and State soon take bids overpass over Panhandle & Santa Fe R. R. on Hy. 15, 9 mi. east of here. $60,000. County Eng. Dpt. or State Hy. Dpt., G. C. Lacy, engr.

Utah, Brigham City—State Rd. Comn., Salt Lake City, plans 2 underpass road structures here. $200,000. K. C. Wright, state hy. engr.

N. B., Fredericton—Provincial P. Wks. Dpt., A. A. Dysart, minister, making plans constructing bridge between Lewisville and Sunny Brae.

Que., Ste. Agathe — Canadian Pacific Ry., Montreal, making plans constructing elevated crossings. $82,200.

Que., Ville St. Pierre — Dpt. Roads, Quebec City, making plans and takes bids in spring, subway under C. N. R.R. tracks at 5th Ave.

BIDS ASKED

Mass., New Bedford—Jan. 13, by City, G. H. Nye, engr., repairing and rebuilding bridge, Coggeshall St. $29,000. P.W.A. project. Fay, Spofford & Thorndike, 44 School St., Boston, engrs. Noted Oct. 9, 1935, C. D.—Jan. 17, 1935, E. N.-R.

New York—Jan. 23, by Triborough Bridge Authority, 111 8th Ave., New York, constructing lighting system for Triborough Bridge connecting Manhattan, Bronx and Queens Boros, Contr. 57.

N. Y., Schenectady—Jan. 13, by New York Central R. R. Co., J. W. Pfau, ch. engr., 466 Lexington Ave., New York, constructing steel structure, concrete abutments for eliminating Carman Street Grade Crossing. $304,100. Noted Dec. 12, 1929, C. D.—Dec. 19, 1929, under "Grade Crossings."

CONTRACTS AWARDED

California—C. H. Purcell, engr. Hy. Dpt., 808 State Bldg., Los Angeles, constructing overhead crossing over tracks of Atchison, Topeka & Santa Fe R. R., 8 mi. west of Needles, San Bernardino Co., to Basich Bros., 20550 Normandie Ave., Torrance, $54,152; undergrade crossing under tracks of Atchison, Topeka & Santa Fe R. R., near Verdemont, San Bernardino Co., to G. Herz & Co., 311 Platt Bldg., San Bernardino, $60,809. Bids Dec. 6, awarded Dec. 20. Noted Dec. 13 C. D.—Nov. 28, E.N.-R.

California—C. H. Purcell, state hy. engr., 808 State Bldg., Los Angeles, undergrade crossing under tracks of Atchison, Topeka & Santa Fe R. R., at Northam, near Buena Park, Orange Co., to Mundo Eng. Co., 2305 East 9th St., Los Angeles, $104,730. Bids Dec. 12, awarded Dec. 20. Noted Dec. 18, C. D.

California—C. H. Purcell, state hy. engr., State Bldg., Los Angeles, constructing undergrade crossing under tracks of Atchison, Topeka & Santa Fe. R.R., Los Angeles Co., to J. Strona, Philadelphia and East Ave., Chino, $146,122. Bids Dec. 5, awarded Dec. 16. Noted Dec. 13, C. D.—Nov. 28, E. N.-R.

California—State Hy. Comn., Los Angeles, constructing undergrade crossing under tracks of Southern Pacific R.R. at Embarcadero Rd., Palo Alto, Santa Clara Co., to Eaton & Smith, 715 Ocean Ave., San Francisco, $132,206. Bids Dec. 3, awarded Dec. 19. Noted Dec. 31, C. D. —Nov. 28, E. N.-R.

California—State Hy. Comn., Los Angeles, constructing undergrade crossing under tracks of Pacific Electric Railway Co. at Firestone Blvd., Los Angeles Co., to Shofner & Gordon, 1831 North Main St., Los Angeles, $106,025. Est. exceeds $25,000. Bids Dec. 13, awarded Dec. 19. Noted Dec. 31, C. D.

California — State Hy. Comn., Sacramento, constructing overhead crossing over tracks of Southern Pacific R.R. ½ mi. east of Tracy, San Joaquin Co., to Lindgren & Swinerton, Inc., 1723 Webster St., Oakland, $223,255. Bids Nov. 27, awarded Dec. 19. Noted Dec. 9, C. D. —Nov. 21, E. N.-R.

California—State Hy. Comn., Sacramento, constructing undergrade crossing under tracks of Sacramento Northern Railway at Mountain Blvd., Oakland, Alameda Co., to A. Soda & Son, 5231 Grove St., Oakland, $49,470; widening existing undergrade crossing at 16th St. in city of Sacramento, Sacramento Co., to Lord & Bishop, Native Sons Bldg., Sacramento, $36,028. Bids Dec. 4, awarded Dec. 19. Noted Dec. 18, C. D.—Nov. 28, E. N.-R.

California—State Hy. Comn., Sacramento, constructing undergrade crossing under tracks of Western Pacific R. R. at Washington Ave., near San Leandro, Alameda Co., to Bodenhamer Constr. Co., P. O. Box 67, Oakland, $149,375; widening undergrade crossing under Southern Pacific R. R. at Army St., San Francisco Co., to M. B. McGowan, Call Bldg., San Francisco, $38,970. Bids Dec. 11, awarded Dec. 19. Noted Dec. 30, C. D.

California—See "Streets and Roads."

Illinois—See "Streets and Roads."

Ind., Evansville — Bd. Comrs. Vanderburgh Co. Court House, superstructure for bridge over Pigeon Creek, 1st and 5th Aves., to McClintic Marshall Corp., Oliver Blvd., Pittsburgh, Pa., $92,615. Former contract rescinded. **P.W.A.** Noted Dec. 23, C. D.—Dec. 26, E. N.-R., under "Contracts Awarded."

Kansas—State Hy. Comn. at office of County Clerk, Independence, viaduct on P. 508-35-WPGH 352-A, Coffey Co., to Koss Constr. Co., 205 Old Colony Bldg., Des Moines, Ia., $83,258*** bridge 0.7, viaduct on P. 160-40-WPGH 282-D, Montgomery Co., to Maxwell Constr. Co., Columbus, $17,924***viaduct P. 54-35-WPGH 367-B, Woodson Co., to L. G. Barcus, Kansas City, $24,495. Grand total $125,677. Bids Dec. 20.

Kansas—State Hy. Comn. at office of County Clerk, Russell (**P. means Project**), Bridge 3.9, two 10x10x32 ft. rein.-con. beam spans, P. 18-5-PWS 24, Russell Co., to Rhoades Constr. Co., Newton, $2,943***Bridge 3.4, six 30 ft., rein.-con. deck girder spans, P. 23-12-PWS 72, Gove Co., to Banta Constr. Co., Harper, $19,151 ***Bridge 14, five 30 ft. rein.-con. deck girder spans, on P. 27-10-PWS 20, Part 2, Wallace Co., to A. L. Cook, Ottawa, $22,939. Grand total $45,033. Bids Dec. 6. Rejected bids Dec. 6, for bridges on hys. in Russell Co. Noted Dec. 2, C. D.

★ **Md., Baltimore**—Bd. Awards, arch span rein.-con. bridge with rubble stone facing, over Jones Falls Valley, 29th St. and Stony Run Blvd., connecting Druid Hill Dr. with 29th St. to Potts and Callahan, Inc., 1st Natl. Bank Bldg., $573,515. **P.W.A.** Bids Dec. 18. Noted Dec. 26, C.D.—Oct. 23, E.N.-R.

★ **Mass., Boston**—City, Dpt. P. Wks., C. J. Carven, comr., City Hall Annex, general contract rein.-con., structural steel superstructure bridge over Chelsea Creek and approaches between East Boston and Chelsea, to T. Stuart & Son, 70 Phillips St., Watertown, $629,446. Bids Dec. 4. General contractor awarded contract for electrical equipment in connection with above work, to General Electric Co., to be installed by P. H. Zipp, New Brunswick, N. J.***gas engine units, to Earle Gear & Machine Co., 4707 Stenton Ave., Phila., Pa. ***granite masonry, curb and blocks, to H. E. Fletcher Co., West Chelmsford***steel sheet piling, to Bethlehem Steel Corp., Bethlehem, Pa. ***structural steel and bascule span machinery, to McClintic, Marshall Corp., Bethlehem, Pa. ***reinforcing steel, to Kalman Steel Co., 75 Federal St., Boston***moving present buildings in way of construction, to Isaac Blair & Co., 433 Harrison Ave., Boston. **P.W.A.** Noted Dec. 18, C. D.—Dec. 5, E. N.-R.

Miss., Vicksburg—See "Streets and Roads."

Mo., St. Louis—Bd. P. Service, City Hall, constructing foundations, rein.-con. piers, abutments, approach fills for South Valley Junction approach to St. Louis Municipal Bridge, to Fruin-Colnon Contg. Co., 502 Merchants Laclede Bldg., $62,560. Est. $59,289. **P.W.A.** Bids Dec. 6. Noted Dec. 16, C. D.—Nov. 28, E.N.-R.

★ **Montana**—State Hy. Comn., Helena, constructing 3 span 139 ft. rein.-con. bridge, Granite Co., to John Coverdale, Anaconda, $18,544***bridge in Butte, Butte-Lawler Corp., Butte, $139,394***3 span 125 ft. steel, concrete viaduct in Jefferson Co., to J. C. Maguire Constr. Co., Butte, $59,343***bridges in Custer Co., to H. Nesbit Constr. Co., Miles City, $24,669***underpass, Cascade Co., to Woodward, Billings, $25,210***bridges in Wheatland Co., to J. L. McLaughlin, Great Falls, $96,844***142 ft. rein.-con., steel underpass in Glasgow, to Lease & Leighland, Great Falls, $121,207***bridges in Musselshell Co., to D. M. Manning, Hysham, $25,676***bridges in Phillips Co., to Massman Constr. Co., New York Life Bldg., Kansas City, Mo., $24,587***186 ft. steel, concrete bridge in Chouteau Co., to T. Staunton Constr. Co., Great Falls, $24,930

†*Federal Government.*

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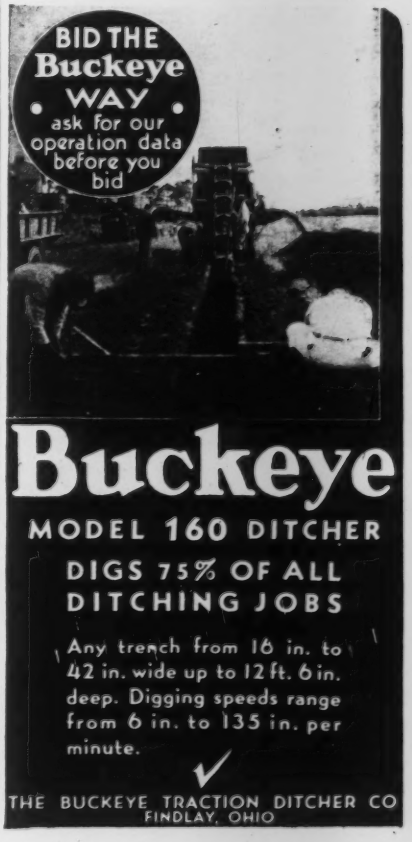
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Bridges, etc. (Continued)

•••bridges in Valley Co., to L. V. Lockwood, Glasgow, $9,224•••undercrossing in Flathead Co., to Nolan Bros., 18 East 2nd St., Minneapolis, Minn., $92,797. Grand total $662,431. Bids Dec. 20. Noted Dec. 13, C. D.

Neb., Ashland — Saunders Co. constructing new bridge and paving approaches, to Central Bridge & Constr. Co., Wahoo, $40,289. **P.W.A.**

New Jersey—See "Streets and Roads."

North Carolina—See "Streets and Roads."

North Dakota—State Hy. Comn., Bismarck, constructing overhead crossing and grade separation structure at crossing of U. S. 52, with Minneapolis, St. Paul & Saulte Ste. Marie Ry. near Baden, to Rue Constr. Co., Bismarck, $35,904. Bids Dec. 3. Noted Nov. 15, C. D.—Nov. 21, E. N.-R., under "Streets and Roads."

Wash., Chehalis—Lewis Co., grading, 1.1 mi. surfacing, placing 130 ft. steel bridge on 26,460 lb. steel piling with 1,072 ft. creosoted fir piling in approaches, Bear Canyon Rd.; incl. 1,632 cu.yd. crushed stone surfacing, 352 ft. 12- to 36-in. concrete culvert pipe, 31 M. ft. untreated lumber and planking, 36 M. ft. treated lumber and planking, 7,340 lb. fabricated steel, to Graham Bros. & Medley, 951 Washington St., $35,238. **P.W.A.** Noted Nov. 21, C. D.—Nov. 28, E. N.-R.

Wash., Seattle—City, bridge over North Queen Anne Dr., and replacing existing deck with open steel grid, Fremont St., to General Constr. Co., 3840 Iowa St., $66,690 and $61,388 respectively•••bridge, Schmitz Park, to Martin Schuehle, 9316 7th Ave. S., $116,038 est. $90,000•••bridge, on McGraw St., to A. Q. Quist & Co., Exchange Bldg., $56,660 est. $60,000. Grand total $300,776. Noted Dec. 9, C. D.—Dec. 12, E. N.-R.

Wisconsin—See "Streets and Roads."

STREETS AND ROADS

BIDS ASKED

Calif., San Jose—J. J. Lynch, city clk., taking bids asphaltic concrete surfacing South Market and South First Sts. $27,850. W. Popp, city engr.

†**Fla., Pensacola**—Yards & Docks, Navy Dpt., Wash., D. C., taking bids concrete and bituminous paving, sewerage, electrical system, etc., Spec. 8084. (Date not set.)

Louisiana — Jan. 15, by State Hy. Comn., Baton Rouge, grading, gravel surfacing 5 mi. Darnell East and West Hys., on Route 592, Project 873-A, West Carroll Parish; 5 mi. Weeks Island-Lydia Hy., Route 157, Project 1109, Iberia Parish; 6.704 mi. Echo-Cheneyville Hy., Route 271, Project 1031, Rapides Parish; 2.5 mi. Pelican-Sabine line Hy., Route 415, Project 1108, De Soto Parish; 5.8 mi. Gibsland-Intersection Route 89 Hy., Routes 565 and 1151, Project 1098, Bienville Parish; 3 mi. hy. from Kinder West, Route 785, Project 1072, Allen Parish; 4 mi. Amite-Scanlon Hy., Route 1261, Project 1111, Tangipahoa Parish; 5 mi. Route 323 between Riddle and Intersection with Route 3, on Route 323, Project 1110, West Feliciana Parish; 3.939 mi. Zachary Bridge-Overflow Creek Hy., Route C-1412, Project 1115, Morehouse Parish; 7 mi. Fellowship-Dubberly Hy., Route 4, Project 1112, Webster Parish; 6.61 mi. Juniata-Hyatt Hy., Route 287, Project 895-B, Beauregard Parish; 8.134 mi. Spring Hill-Plainview Hy., Route 751, Project 946 A-1, Washington Parish; 4.53 mi. hy. between Slaughter and Lindsey, Routes 305 and 307, Project 639-A, East Feliciana Parish; grading, surfacing 6.979 mi. Campti-Clear Lake Hy., Route 606, Project 870-A, Natchitoches Parish; grading, shell surfacing 9.627 mi. Pillette-Intersection Route 236 on Route 680, Project 1114, Lafayette Parish; concrete paving 5.94 mi. roads through Lockport and Golden Meadows on Routes 78,620 and 622, Project 2816 Lafourche Parish.

Louisiana — Jan. 22, by State Hy. Comn., Baton Rouge, grading, gravel surfacing 8 mi., Group 2 hys., Project 1128, Jefferson Davis Parish; 2.971 mi. Carlton-Pleasant Valley Church Hy., Route C-1424, Project 1120, Ouachita Parish; 2.272 mi. Intersection Route 276-Intersection Route 882, Hy., on Route C-1422, Project 1118, East Baton Rouge Parish; 6.046 mi. Verot-School-Intersection Route 43, and Milton Hy., on Routes C-1421 and 538, Project 116, Lafayette Parish; 7.8 mi. Wisner-Kendricks Hy., Routes 630 and 631, Project 1113, Franklin Parish; 2.251 mi. Intersection Route C-1352-Vincent School Hy., on Route 382, Project 1106, Calcasieu Parish; 10.297 mi. Intersection Route 46-Oldsfield Hy., on Route 340, Project 1083, Livingston Parish; 2 mi. Himalaya-Percle Hy., on Route C-1420, Project 1071, Assumption Parish; 6.645 mi. Derry-Gorum Hy., on Routes 430 and 265, Project 903-A, Natchitoches Parish; 4 mi. Simsboro-Springhill Church Hy., on Routes C-1423 and 548, Project 900-A, Lincoln Parish; 8.826 mi. Singer-Longville Hy., Route 285, Project 896-A, Beauregard Parish; 8 mi. Hornbeck-Toro Hy., Route 403, Project 808-A-1, Vernon and Sabine Parishes; 6.697 mi. Castor Creek-Intersection Route 110 Hy., on Route 246, Project 749-C, Caldwell Parish; grading, shell gravel surfacing, 6 mi. Mamou-Fenris Intersection Route 221 Hy., on Route 570, Project 1119, Evangeline Parish.

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Minnesota—Jan. 17, by State Hy. Dpt., St. Paul, bituminous material and wearing course mixture paving 9.3 mi. State Project 28-28-26-3 and S.P. 28-28-26-2A and B F.A.P. 240, between Graceville and east county line; grading 20.5 mi. S.P. 12-26-24-2, 3 and 4, and S.P. 12-26-25-1A, F.A.P. 401C, F, I and H, between Ortonville and 20.5 mi. east; 18.5 mi. S.P. 12-26-25-1B, S.P. 12-26-25-2A and B, and S.P. 12-26-231A and B, F.A.P. 401H, D, E, B and A, between 20.5 mi. east of Ortonville and 2 mi. west of Benson.

Miss., Meridian—See "Contracts Awarded."

N. Y., Saranac Lake—Village Bd. received no bids Dec. 17, rein.-con. paving Broadway. **Maturity indefinite.** Noted Dec. 10, C. D.—Dec. 12, E. N.-R.

O., Cincinnati — City rejected bids Dec. 10, grading, draining, sewers, curbing, guttering, walks, rein.-con. paving, rein.-con. vehicular and pedestrian bridge, on 1,025 ft. McGregor Ave. Noted Dec. 19, C. D.—Dec. 26, E. N.-R.

Oklahoma—State Hy. Dpt., Oklahoma City, received no bids Dec. 19, constructing 19 farm-to-market roads. May be readvertised. V. T. Moon, Oklahoma City, state hy. engr. Noted Dec. 11, C. D.

Oklahoma — Jan. 14, by State Hy. Dpt., Oklahoma City, grading, drainage 36th St., Project WPMS 455 A, Oklahoma Co., $25,148. P.W.A. project. V. T. Moon, state hy. engr.

Tennessee—Jan. 17, by Dpt. Hys. & P. Wks., Nashville, paving 1.993 mi. State Hy. 27, between Glendale and Valdeau, W.P.M.H. 2-C, Hamilton Co.; grading, drainage 3.741 mi. State Hy. 61, WPSS 287-C, Roane Co.; 6.029 mi. Non-System Hy., WPMS 426-A, Parts 1 and 2, Shelby Co.

Virginia—Jan. 16, by State Hy. Dpt., Richmond, concrete paving 1 mi. Route 360, State Project 247-W1, 2, Fed. Project 247, Henrico Co., incl. 3,172 cu.yd. excav.; macadam paving 5.4 mi. Route 21, State Project WPH-406-G1, Fed. Project WPH-366-B, north of Bastian; 5.2 mi. Route 501, State Project 688-C1, 2 and 3, 50-84, Campbell Co.; 198,120 cu.yd. excav.; bituminous surfacing 0.37 mi. Route 11, 460, State Project 1027-GHIJ, Fed. Project NRM 402-H1, 104-D, 389-H, in Roanoke, incl. 845 cu.yd. excav.; bituminous paving 0.2 mi. Route 60, WPMH-1035-J, Fed. Project WPMG 517-B, Richmond, incl. 6,600 cu.yd. excav.; 5.5 mi. soil surfacing and S.T. paving 1.5 mi. Route 20, State Project WPSS 1035-J, Fed. Project WPMH-WPSS 540-A, Buckingham Co., incl. 62,634 cu.yd. excav.

Wash., Everett — City Council received no bids Dec. 14, concrete paving 19,055 sq.yd. 19th St. from Rucker to Walnut Sts. $62,676. Noted Dec. 9, C. D.

CONTRACTS AWARDED

California—State Hy. Comn., Sacramento, grading, crushed run and road mix surfacing and liquid asphalt by road mix method surface treating 6.6 mi. hy. between Yokohl and 1 mi. north of Lemon Grove, Tulare Co., and grading, road mix surfacing on untreated crushed gravel or stone base surfacing 3/4 mi. hy. between Sullivan Creek and 3½ mi. easterly, Tuolumne Co., to Union Paving Co., Call Bldg., San Francisco, $147,775 and $104,235 respectively. Bids Nov. 27, awarded Dec. 19. Noted Dec. 23, C. D.

California—State Hy. Comn. State Bldg., Los Angeles, grading, applying road mix surface treatment 2.5 mi. hy. between 1 mi. northwest of Lake Arrowhead and Lake Arrowhead Dam, San Bernardino Co., to G. J. Bock Co., 1120 North Las Palmas Ave., Los Angeles, $80,512. Bids Nov. 29, awarded Dec. 19. Noted Dec. 9, C. D.—Nov. 21, E. N.-R.

California—C. H. Purcell, State Hy. engr., 808 State Bldg., Los Angeles, grading, applying road mix surface treating 4.7 mi. hys. between westerly boundary and Route 59, San Bernardino Co., to Basich Bros., 20,500 Normandie Ave., Torrance, $130,717. Noted Dec. 2, C. D.

California—State Hy. Comn., Sacramento, grading 2.6 mi. hy. between 1.8 mi. north of Bishop and 1.4 mi. north of Laws, Inyo Co., to Basich Bros., 20530 Normandie Ave., Torrance, $16,973•••grading, crusher run base, plant-mixed surfacing 7.7 mi. hy. between 4 mi. east of Belle Vista and Diddy Hill, Shasta Co., to Peninsula Paving Co., 9 Main St., San Francisco, $197,658. Bids Dec. 3, awarded Dec. 17. Noted Dec. 24, C. D.—Nov. 28, E. N.-R.

California—C. H. Purcell, engr., State Hy. Bldg., Los Angeles, grading, selected material base surfacing 2.6 mi. hy. between Luitwiller Ave. and La Marada Ave., Los Angeles and Orange Counties, to R. E. Campbell Constr. Co., 108 West 6th St., Los Angeles, $332,995. Bids Dec. 6, awarded Dec. 17. Noted Dec. 13, C. D.—Nov., 28, E. N.-R.

California—State Hy. Comn., Sacramento, roadbed widening and construct widening strips consisting of plant-mixed surfacing (medium curing type) on untreated crushed gravel or stone base 14.8 mi. hy. between south boundary and 3 mi. north of Los Molinas, Tehama Co., to Hemstreet & Bell, 501 11th St., Marysville, $146,015. Bids Nov. 27, awarded Dec. 16. Noted Dec. 23, C. D.

California—State Hy. Comn., Sacramento, grading, bituminous macadam on crusher run surfacing, constructing 2 bridges on 0.5 mi. hy. through town of Ben Lomond, Santa Cruz Co., to Lord & Bishop, Native Sons Bldg., Sacramento, $55,845. Bids Dec. 18, awarded Dec. 24. Noted Jan. 2, C. D.

California—State Hy. Comn., C. H. Purcell, state hy. engr., 808 State Bldg., Los Angeles, grading, constructing timber bridge 2.5 mi. Somerset Ave., between Spring St. and Hathaway Ave., Los Angeles Co., to R. E. Campbell, Central Bldg., Los Angeles, $61,182; grading, plant mixed surfacing 5.9 mi. hy. between Somis and Saticoy, Ventura Co., to Oswald Bros., 366 East 58th St., Los Angeles, $51,209. Bids Dec. 12, awarded Dec. 24. Noted Dec. 18, C. D.

California—State Hy. Comn., Sacramento, grading, constructing bridge and applying road mix surface treatment 3.1 mi. hy. between River Rd. and point 2 mi. west of Cates Rd., Stanislaus Co., to Pacific Bridge Co., 1111 Balfour Bldg., San Francisco, $162,973; grading, untreated crushed gravel or stone surfacing 2.9 mi. hy. between point 3.4 mi. east of Butte Creek and Cherokee Canal, Butte Co., to E. B. Bishop, Oroville, $17,095. Bids Dec. 10, awarded Dec. 19. Noted Dec. 31, C. D.

California—C. H. Purcell, state hy. engr., 808 State Bldg., Los Angeles, grading, gravel and road mix surface treating, timber bridge and structures 9.8 mi. hy. between points 3 mi. east of Imperial and 4 mi. east of Brawley, Imperial Co., to R. E. Hazard & Son, 2548 Kettner Blvd., San Diego, $45,505; grading, liquid asphalt treating and constructing timber pile trestle, 2.7 mi. hy. between Los Angeles Co. line and Pine Line Ave., San Bernardino Co., to Dinmitt & Taylor, 815 East 50th St., Los Angeles, $62,280. Bids Dec. 13, awarded Dec. 24. Rejected bids Dec. 13, widening and asphaltic concrete paving 0.4 mi. hy. adjacent to the Plaza in City of Orange, Orange Co. Noted Dec. 31, C. D.—Dec. 5, E. N.-R.

Calif., Oakland—W. W. Chappell, city clk., grading, asphaltic concrete paving, walks, concrete curbing Telegraph Ave. between 40th and 51st Sts., to Ransome Co., 4030 Hollis St., Emeryville, $16,325; grading, concrete and macadam pavements, catchbasins, conduit, etc., 22nd St. between Cypress and Adeline Sts., $8,980. **P.W.A.** Bids Nov. 29, awarded Dec. 23. Noted Dec. 12, C. D.

Calif., Oakland—City Council, grading, concrete, asphaltic concrete paving Grove St. from 1st to San Pablo Sts., to L. J. Immel, 1031 Evelyn St., Berkeley, $31,445. Awarded Dec. 26. Bids Dec. 5. Noted Dec. 17, C. D.

Colorado—State Hy. Dpt., Denver, gravel surfacing 2.75 mi. hy. between Starkville and Mosley, Las Animas Co., to Driscoll Constr. Co., Pueblo, $78,792. Bids Dec. 18. Noted Dec. 24, C. D.

★ **Illinois** — Dpt. P. Wks. & Buildings, Div. Hys., Springfield, concrete paving 1.0541 mi. near Forest Park, and 0.0541 mi. road in Forest Park, to T. McQueen, 1313 Circle Ave., Oak Park, $94,277 and $31,458 respectively (not **P.W.A.**)•••0.9951 mi. road in Chicago, to Holway Constr. Co., Chicago, $149,151••• 1.5813 mi. near Chicago, and rein.-con. bridge near Chicago, to Midwest Constr. Co., LaSalle St., Chicago, $203,366 and $34,073 respectively •••asphalt resurfacing roads 1.2853 mi. and bituminous resurfacing 1.1268 mi. near Chicago, to Arcole Asphalt Co., Chicago, $59,444 and $48,655 respectively•••concrete paving 0.9798 mi. and 0.8353 mi. roads near Chicago, to Milburn Bros., Mount Prospect, $196,492 and $102,092 respectively•••1.4441 mi. road near Chicago, to G. H. Summerville & Co., Inc., Harvey, $87,990•••1.0934 mi. road near Chicago, to Chicago Heights Coal Co., Chicago, $141,844•••concrete or bituminous concrete paving 0.7633 mi. road near Chicago, to Bates Constr. Co., 4709 Arthington Ave., Chicago, $91,638, all foregoing Cook Co.•••traffic bound surface course paving 0.5559 mi. near Wilburn, Marshall Co., to C. L. Swords, Peoria, $10,174•••concrete paving 0.435 mi. and 0.3955 mi. in Rock Island City, to Valley Constr. Co., Rock Island, $20,233 and $13,749 respectively, all foregoing **P.W.A.**•••constructing underpass near Berwyn, Cook Co., to Davidson & Doctor, Orland Park, $13,479. Grand total $1,297,845. Bids Nov. 22.

Ill., Moline—City Council, widening and repaving 19th Ave. from 3rd to 12th Aves., to W. A. Phelan Constr. Co., Davenport, Ia., $52,590. **P.W.A.** Bids Dec. 12.

Ill., Salem—Dpt. P. Wks. & Buildings, Div. Hys., Springfield, traffic bound macadam paving Sect. 12-1-MFT, near Kinmundy, to French Constr. Co., Fairfield, $28,741. Bids Nov. 15.

Ill., Springfield—Dpt. P. Wks. & Bldgs., Div. Hys., 0.8598 mi. road to Hurden Constr. Co., Springfield, $95,725. Bids Nov. 4. Noted Oct. 23, C. D.—Oct. 31, E. N.-R.

Iowa—Lyon Co., Rock Rapids and Osceola Co., Sibley, grading No. 9 cutoff across Lyon and Osceola Counties, to Green Constr. Co., 1201 Capitol Theatre Bldg., Des Moines, $38,000; culverts on same road, to H. Neol Peterson, $6,754. Est. $50,000. Bids Dec. 19.

Kansas—State Hy. Comn. at office of County Clerk, Hiawatha (**P. means Project**), to D. G. Hansen, Logan, flint gravel surfacing 6.928 mi. P. WPSO 499-A, Brown Co., $9,643; sand gravel ing 13.3 mi. P. 40N-27-6679, $9,680. 9 mi. P. D 40N-24-8081, $2,144, both Riley Co. •••to Blue Rapids Gravel Co., Blue Rapids, 8.5 mi. P. 77-24-6681, Marshall Co., $1,173; 3.5 mi. P. 77-22-6680, Riley Co., $483; 6 mi. P. 77-23-6682, Riley Co., $828•••to Roberts Constr. Co., Wichita, 4.5 mi. P. 71-1-6684, Nemaha Co., $2,133•••to Imperial Constr. Co., 8 mi. P. 70-1-6683, Lyon Co., $2,376•••to Collins Constr. Co., 11 mi. P. 73-32-6672, Atchison Co., $2,959; 0.9 mi. P. 73-33-6673, Brown Co., $251; 5.6 mi. P. 73-34-6674, Brown Co., $1,560 •••to B. Metzger, Ozawkie, 9.6 mi. P. 75-29-

†*Federal Government*

Streets and Roads (Continued)

6671, Jackson Co., $2,515. Grand total $28,747. Bids Dec. 10. Noted Dec. 2, C. D.—Dec. 5, E. N.-R.

Kansas—State Hy. Comn. at office of County Clerk, Independence, earthwork and culverts 0.56 mi. P. 508-35-WPGH 352 A, Coffey Co., to List & Clark Constr. Co., Railway Exchange Bldg., Kansas City, Mo., $31,436***earthwork and culverts 0.549 mi. P. 54-35-WPGH 367-B, Woodson Co., to C. J. List Constr. Co., Railway Exch. Bldg., Kansas City, Mo., $40,509***concrete paving 2.08 mi. P. 75-5-FA 23A, Part 2, and 2.011 mi. P. 75-5-FA 479 A, $50,539 and $50,-302 respectively***earthwork and culverts and light type surfacing 0.131 mi. P. 160-40-WPH 282-D, and 0.571 mi. P. 160-40-WPGH 282 D, $783 and $42,289 respectively, all foregoing Montgomery Co. Grand total $215,918. Bids Dec. 20.

Kansas—State Hy. Comn. at office of County Clerk, Russell **(P. means Project)**, to Cook & Ransom, Ottawa, earthwork and culverts 0.985 mi. P. 18-5-WPH 340D, Part 1, $81,497; earthwork, culverts, curbing and guttering 0.242 mi. P. 18-5-WPMH 340D, Part 2, $5,289; 0.248 mi. P. 18-5-WPMH 340D, Part 3, $3,416; 0.419 mi. P. 18-5-WPGH 340D, $12,165; earthwork 0.06 mi. P. 8-17-WPH 340D, Part 4, $31, all foregoing in Russell Co.***to M. W. Watson, National Bank of Topeka Bldg., Topeka, sand graveling 4.731 mi. P. 36-1-FA 145-A, Cheyenne Co., $2,853; 0.912 mi. P. 36-1-FA 145-B, Cheyenne Co., $550; 17.46 mi. P. 1-15-6670, Ellis Co., $4,994; sand graveling for cover material 9.3 mi. P. 40N-3-6668, Thomas Co., $1,709***to Cook & Cone, Ottawa, sand graveling 10.5 mi. P. 23-13-6669, Gove Co., $2,478 ***to L. F. Harper, Great Bend, earthwork and culverts 0.952 mi. P. 27-10-PWS 20, Part 1, $3,449; 0.519 mi. P. 27-10-PWS 20, Part 2, $10,925, both Wallace Co. Grand total $129,-356. Bids Dec. 6. Noted Nov. 29, C. D.

Mass., Waltham—City, Dpt. P. Wks., H. F. Beal, city engr., bituminous macadam street construction and surface drains, School and Warren Sts., to P. Salvucci, 55 Pond St., Waltham, $8,851 and $25,157 respectively. Bids Dec. 4, awarded Dec. 20. Noted Dec. 17, C. D.

Mich., Saugatuck—R. W. Clapp, village clk., improving Lincoln Rd., 13,000 cu.yd. excav. and grading 8,666 sq.yd. concrete pavement, drainage structures, guard rail, etc., to John G. Yerrington, Benton Harbor, $22,807. **P.W.A.** Bids Dec. 14. Noted Dec. 9, C. D.

Minn., Renville—City, F. Dunwell, clk., 8,700 sq.yd. concrete paving, 5,600 lin.ft. combined curbing and guttering, 400 lin.ft. sanitary sewer, 4 manholes and 2,000 lin.ft. storm sewer, to Hallett Constr. Co., Crosby, Minn., $27,402; 40,000 sq.yd. bituminous gravel surfacing, tar and cutback, to Duininick Bros., Prinsburg, $23,273 and $21,483 respectively. Grand total $72,158. **P.W.A.** Bids Dec. 6.

Miss., Meridian—City, resurfacing 6 blocks on 5th St. and 6 blocks on 22nd Ave., involving 20,000 sq.yd. and grading, drainage on various streets in city, W.P.A. labor. Est. $33,000. J. C. Watts, Meridian, engr. Furnishing 600 tons Alabama rock asphalt, to J. E. Wright Constr. Co., Meridian.

Miss., Vicksburg—Mayor and Council at office of Mayor, City Hall Bldg., resurfacing Cherry St., revision of sewers and constructing 2 bridges, to Garvey Constr. Co., Vicksburg, $47,618. Est. $48,563. **P.W.A.** J. L. Hyland, Vicksburg, engr.

Mo., Independence—City, concrete paving 8,200 ft. Winner Rd., to W. A. Ross Constr. Co., 25th and Summit Sts., Kansas City, $76,-857. **P.W.A.** Bids Sept. 30.

★ **Montana**—State Hy. Comn., Helena, grading, constructing drainage structures in Missoula Co., to J. S. O'Connor, Butte, $101,268 ***grading, surfacing, drainage structures and bridges in Big Horn Co., to C. A. Wagner, Sioux Falls, S. D., $43,990***grading, bituminous surfacing, small drainage structures, Custer Co., to Prahl & Sawtell, Miles City, $168,965***grading, surfacing, bituminous treated stockpass, in Dawson Co., to Nolan Bros., 18 East 2nd St., Minneapolis, Minn., $22,-358***11.976 mi. Sheridan Co., to Lobnitz Bros., Inc., Libby, $107,932***12.577 mi. Musselshell Co., to Tomlinson Arkwright Constr. Co., Great Falls, $140,417***grading, surfacing, small drainage structures 4.407 mi. road in Wibaux Co., and 3.932 mi. Richland Co., to A. Lalonde, Sidney, $52,819 and $39,-467 respectively, 2.34 mi. Carter Co., to J. C. Boespflug, Miles City, $38,442***0.1027 mi. Cascade and Chouteau Counties, to S. Birch & Sons Constr. Co., Great Falls, $113,455*** 2.449 mi. Granite Co., to J. C. Gudgell, Kalispell, $38,337***5.516 mi. Petroleum Co., to Collison & Colvin, Billings, $49,676***2.339 mi. Valley Co., to C. Braathen, Malta, $29,-789. Grand total $947,015. Bids Dec. 20. Noted Dec. 13, C. D.

Nevada—State Hy. Comn., Carson City, to Nevada Rock & Sand Co., Reno, constructing road in Storey and Lyon Counties, $180,004*** to Pacific Constr. Co., San Francisco, Calif., roads in Las Vegas, Clark Co., $83,860; White Pine Co., $48,505; Clark Co., $82,602. Grand total $394,971. Bids Dec. 13.

★ **New Jersey**—State Hy. Dpt., Trenton, improving State Route 29, Sect. 1, and Routes 4 and 35, Sect. 11, to Franklin Contg. Co., 20 Wabash Ave., Newark, $209,141 and $431,097 respectively***Route 44, Oldmans Creek Bridge, to Vare Constr. Co., Broad and Vine Sts., Phila., Pa., $190,921***Route 34, Sect. 6, to Linde Griffith Co., 152 Passaic Ave., Newark, $304,-966***Route 40, Sects. 10 and 11, to C. D. Prosser, 3 Simpson Ave., Pitman, $149,134 ***Route 34, Brielle Circle, to S. J. Groves & Sons Co., 509 Broad Ave., Ridgefield, $142,606. Grand total $1,427,865. Noted Dec. 23, C. D. —Dec. 26, E. N.-R.

New Jersey—State Hy. Dpt., Trenton, constructing 1.019 mi. Route 33, Sect. 3C from Hurley's Corner to Shark River Station Rd., Monmouth Co., to F. McDowell, Neptune, $153,100; paving 2.88 mi. Route 25, Sect. 22A, Hightstown By-Pass, Mercer Co., to Tidewater Stone & Supply Co., 65 Court St., Hackensack, $194,552. Bids Dec. 30. Noted Dec. 19, C. D. —Dec. 26, E. N.-R.

N. Y., New York—S. Levy, pres. Manhattan Boro, Municipal Bldg., to Venetian Contg. Co., 2 Lafayette St., New York, granite block paving 1st Ave., $88,308; East 112th St., $11,871; sheet asphalt paving West 145th St., $9,298*** to St. George Paving Co., 415 Lexington Ave., granite block paving Clarkson St., $15,518. Grand total $124,995. Bids Dec. 17. Noted Dec. 18, C. D.—Dec. 12, E. N.-R.

★ **N. Y., New York**—S. Levy, pres. Manhattan Boro, Municipal Bldg., constructing Contr. 13, Sect. 1, Div. 4, 12th Ave. and Marginal St. from West 46th to West 59th Sts., incl. foundations, superstructures with ramps in connection with Elevated Express highway, to James Stewart & Co., Inc., 230 Park Ave., New York, $1,957,-018. Bids Dec. 18. Noted Dec. 19, C. D.—Dec. 12, E. N.-R.

★ **North Carolina**—State Hy. Dpt., Raleigh, sand clay surfacing, structures 7.91 mi. Bertie Co., to C. A. Ragland, Louisburg, $44,-885***grading, concrete paving 2.04 mi. Pitt and Beaufort Counties, to F. J. McGuire, Washington, $54,655***grading, structures and sand clay surfacing 5.78 mi. Wayne Co., to George Goodwin & Co., Inc., Raleigh, $25,480*** underpass and approaches 0.22 mi. Cumberland Co., and roadway on 0.52 mi. Rutherford Co., to Blythe Bros. Co., 120 Brevard Court, Charlotte, $100,021 and $12,490 respectively ***roadway 6.08 mi. Forsyth Co., to Gassoway & Owen, Inc., Winston Salem, $66,404*** structures on same road, to Hobbs Peabody Constr. Co., 317 West Worthington St., Charlotte, $17,787***roadway 12.78 mi. Robeson Co., to E. W. Grannis, Fayetteville, $51,664 ***structures on same road, to Bowers Constr. Co., Whiteville, $13,934***roadway 10.06 mi. Franklin Co., to J. M. Gregory, Raleigh, $46,-714***structures on same road, to Bowers Constr. Co., Whiteville, $16,836***underpass and approaches 0.38 mi. Alamance Co., to Wm. Muirhead Constr. Co., Durham, $117,263*** overhead and approaches 0.09 mi. Davidson Co., and grading, structures 12.57 mi. Catawba and Lincoln Counties, to Cobb & Homewood, Chapel Hill, $20,647 and $86,557 respectively ***structures 0.52 mi. Rutherford Co., to T. A. Loving & Co., Goldsboro, $68,654. Grand total $743,391. Noted Dec. 11, C. D.

O., Akron—City, brick repaving Kenmore Blvd. from 18th St. to city limits, to Thorpe Constr. Co., 943 Hazel St., $81,271 est. $80,-000; Hawkins Ave. from Copley Rd. to Wooster Ave., to C. W. P. Constr. Co., 643 East Buchtel Ave., $48,877 est. $50,000. **W.P.A.**

O., Cincinnati—City, grading, draining, water lines, walks, retaining wall, 9 in. rein.-con. paving 16,010 sq.yd. Columbia Ave. from Stites to Delta Sts., and grading, draining, sewers, curbing, walks, water lines, 9 in. rein.-con. paving 14,445 sq.yd. California Ave., to O'Connell & Sweeney, Kellogg and Tennyson Aves. $65,618 and $50,947 respectively. Est. $74,213 and $57,530 respectively. **P.W.A.** Noted Jan. 2, C. D.—Jan. 9, E. N.-R.

Oklahoma—State Hy. Dpt., Oklahoma City, grading, draining, graveling 5.62 mi. road in Dewey Ct., to J. J. Thompson, Insurance Bldg., Oklahoma City, $33,763 est. $41,091***7.836 mi. Dewey Co., to Ellis & Lewis, 507 Surety Bldg., Muskogee, $39,811, est $32,000***3.31 mi. road in Jackson Co. and 3.88 mi. Greer Co., to Witt & Tatum, Grandfield, $35,081 and $29,544 respectively, est. $34,988 and $29,395 respectively. Grand total $129,199. Bids Dec. 19. Noted Dec. 11, C. D.

Rhode Island—State, Bd. Contrs., Standards & Purchases, State House, Providence, G. H. Henderson, ch. engr., surface treated gravel paving 3.402 mi. F.A.P. W.P.S.C. 120, Contr. 3512, Burrillville, to John Ambrose Constr. Co., Inc., 1100 Pontiac Ave., Cranston, $31,363 ***granolithic sidewalks and concrete curbing Bath Rd. and Old Beach Rd., F.A.P. W.P.M.H. 92, Contr. 3513, Newport, to Callan Constr. Co., Bay View Ave., Bristol, Conn., $7,955. Bids Dec. 2, awarded Dec. 18. Noted Dec. 12, C. D.

Tennessee—State Hy. Comn., Nashville, paving 2.683 mi. State Hy. 3, F.A.P. R-8-A, Extended and R-8-A, reopened part 4, Shelby Co., to Forcum-James Co., Dyersburg, $62,176*** grading, drainage and relocation of 4.564 mi. State Hy. 1, W.P.G.M. 21 and W.P.G.H. 21, Carroll Co. and grading, drainage 4.043 mi. State Hy. 18, W.P.H. 268-A, Fayette Co., to J. Oman, Jr., Acklen Park, Nashville, $45,251 and $41,966 respectively***grading, drainage 0.180 mi. State Hy. 52, W.P.S.S. 406-E, Morgan Co., to Walters & Prater, Morristown, $12,823*** grading, drainage, paving 0.542 mi. State Hy. 1, F.A.P. 434-A, Shelby Co., to Carey-Reed Co., 575 North Front St., Memphis, $86,174. Grand total $248,390. Bids Dec. 20. Rejected bids Dec. 20, paving 1.993 mi. Hy. 27, Hamilton Co., and grading, drainage, paving 0.608 mi. State Hy. 15, Franklin Co. Noted Dec. 10, C. D.—Dec. 12, E. N.-R.

Federal Government.

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Ransome

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Streets and Roads (Continued)

Texas—G. Gilchrist, state hy. engr., Austin, grading, drainage structures 4.945 mi. State Hy. 146, WPMS 820-A and WPSS 820-B, Liberty Co., to Jensen Constr. Co., Austin, $72,983 est. $80,000***grading extension, small drainage structures, waterbound broken stone base and concrete paving, cut back asphalt surfacing 0.32 mi. State Hy. 1, El Paso Co., to West Texas Constr. Co., 501 East Rosedale St., Fort Worth, $27,208 est. $25,000***resectioning and widening drainage structures 5.764 mi. State Hy. 63, Jasper Co., to J. S. Moore & Sons, Lufkin, $73,582 est. $80,000. Grand total $173,773. New **P.W.A.** Bids Dec. 3. Noted Dec. 11, C. D.

Texas—G. Gilchrist, state hy. engr., Austin, grading, small drainage structures 5.459 mi. State Hy. 31, W.P.H. 147-B, Smith Co., to Standard Paving Co., 251 Majestic Bldg., Fort Worth, $120,207. Est. $120,000. New **P.W.A.** Bids Nov. 19. Noted Nov. 25, C. D.

Tex., Houston—H. L. Washburn, aud. Harris Co., grading, drainage structures, concrete paving 2.468 mi. Post Oak Rd., to Gaylord Co., Houston, $75,089 est. $76,000***grading, drainage structures, single bituminous surface treating 5.34 mi. Campbell Rd., and 5.454 mi. Long Point Witte Rd., to Haden & Austin, 1st Natl. Bank Bldg., $33,457 and $72,585 respectively est. $35,000 and $75,000 respectively*** 3.369 mi. Kuykendall-Haffsmith and Stuebner Air Line Rd., to H. H. Hedges, 1910 Runnels St., Houston, $79,840 est. $80,000***grading, bridge over Greens Bayou, Wallisville Rd., to Austin Bridge Co., 1813 Clarence St., Dallas, $47,390 est. $50,000. Grand total $308,361. **P.W.A.** Bids Dec. 11. Noted Dec. 5, C. D.

Tex., Houston—Harris Co., c/o H. L. Washburn, aud., grading, drainage structures and bit. surface treating 6.569 mi. Aldine-Westfield Rd. and grading, drainage structures, rein.-con. paving 8.088 mi. Market St. Road, to Gulf Bitulithic Co., 2820 Polk St., $101,495 and $195,114 respectively, est. $96,000 and $198,000 respectively***grading, drainage structures, bit. surface treating 5.434 mi. Anderson Rd., to Brown & Root, 4300 Calhoun St., $55,647*** grading, drainage structures, rein.-con. paving 0.624 mi. Clinton Rd., to Froemming Bros., 3901 Miramar St., Dallas, $23,041 est. $20,000. Grand total $375,297. **P.W.A.** Bids Dec. 6. Noted Dec. 18, C. D.

Utah—State Rd. Comn., Salt Lake City, grading, draining 2.767 mi. Washington Co., to Knowlton & Repert, Layton, $32,573 est. $31,784***1.208 mi. Salt Lake Co., to F. S. Whiting, Kaysville, $40,181 est. $46,227***grading, crushed gravel surfacing 3.682 mi. Emery Co., to J. M. Sumison, Springville, $33,695 est. $36,847. Grand total $106,448. Bids Dec. 20. Noted Dec. 16, C. D.

Vermont—State Hy. Dpt., H. E. Sargent, ch. engr., Montpelier, grading base and drainage 0.6 mi. Projects 81-I and 81-J, Hardwick, to Troy Paving Co., Hudson Falls, N. Y., $39,230; grading, base and double tack coat of refined tar on 0.8 mi. Route 30, Project 192-A, Hubbardton, to Bristol Contg. Co., Inc., Bristol, N. H., $8,010. Bids Dec. 13, awarded Dec. 20. Noted Dec. 23, C. D.

Virginia—State Hy. Dpt., Richmond, bituminous surfacing 6.319 mi. Smyth Co., to Pendleton Constr. Co., Wytheville, $162,718*** 3.269 mi. Warwick Co., to Carpenter Constr. Corp., Norfolk, $58,710***4.54 mi. Henrico and Goochland Counties, to G. P. Clay, Richmond, $50,597***4.254 mi. Greensville Co., to W. H. Scott, Franklin, $41,253***4.81 mi. Stafford Co., to G. G. Waugh & Co., Culpeper, $35,576***1.123 mi. Tazewell Co., to J. A. McQuail, Richlands, $34,598***1.6 mi. Nansemond Co., to Roberts Paving Co., Salisbury, Md., $29,981***0.59 mi. Dinwiddie Co., to F. M. Arthur, South Boston, $14,190. Grand total $427,532. Bids Dec. 12. Noted Dec. 19, C. D.—Dec. 5, E. N.-R.

Wash., Cathlamet—City, clearing, grubbing, grading, surfacing Eden-Altoona Rd., to Tide Point Co., Astoria, Ore., $48,066. G. L. Osborne, Court House, engr. Noted Dec. 18, C. D. —Dec. 26, E. N.-R.

Wash., Seattle—King Co., to N. Fiorito, Inc., 844 West 48th St., grading R. A. Ballinger Rd., $53,945; paving Maple Valley-Black Diamond Rd., $46,867; paving Third Ave. N.W., $22,027. Grand total $122,839. Noted Dec. 16, C. D.

Wisconsin—State Hy. Comn., Madison, shale base course and crushed stone surfacing 8.077 mi. road in Crawford Co., to P. W. Ryan Sons, 303 South 3rd St., Janesville, $93,092***structure on Douglas Co., to Industrial Contg. Co., 30350 4th Ave. S., Minneapolis, Minn., $33,651 ***bridge and approaches in Douglas Co., to H. S. Kaliher, Washburn, $34,596. Grand total $161,339. Bids Nov. 26 and Dec. 10.

Wisconsin—State Hy. Comn., Madison, graveling 3.497 mi. roads in Columbia Co., to R. M. Murphy, Route 2, West DePere, $14,481*** grading, draining 3.497 mi. Columbia Co., to F. C. Raemisch, Waunakee, $58,745***0.529 mi. Waukesha Co., to Kramp Constr. Co., 803 East Wisconsin Ave., Milwaukee, $28,368*** 0.625 mi. Green Lake Co. and 1.003 mi. Marquette Co., to A. J. Pagel, Almond, $16,543 and $9,358 respectively***0.767 mi. Pepin Co., to Williams & Williams, Strum, $19,567***0.775 mi. St. Croix Co., to L. G. Arnold, Eau Claire, $14,727***0.581 mi. Iron Co., to F. Genisot, Hurley, $8,333***one 50 ft. I-beam span bridge in Columbia Co., to Brennan Bros., Lansing, Ia., $17,463***one 30 ft. timber and concrete bridge and 0.227 mi. approaches in Jefferson Co., to Mid-State Constr. Co., 821 Miami Pass, Madison, $6,305. Grand total $193,890. Bids Dec. 10. Noted Dec. 16, C. D.—Dec. 5, E. N.-R.

Wyoming—State Hy. Dpt., Cheyenne, grading, draining, 4 timber bridges, 10 rein.-con. culverts, and miscellaneous work on 18.808 mi. road in Sweetwater Co., to W. W. Clyde & Co., Springville, Utah, $336,163. Bids Dec. 27. Rejected bids Dec. 27, improving roads in Goshen Co. Noted Dec. 17, C. D.—Dec. 26, E. N.-R.

Alaska, Petersburg—City, City Hall, filling, regrading, streets, sidewalks and constructing and improving sewers, to Wright & Stock, Lowman Bldg., Seattle, Wash., $50,172. **P.W.A.** Awarded Dec. 13. Stratton & Beers, Valentine Bldg., Juneau, engrs.

EARTHWORK, IRRIGATION DRAINAGE AND WATERWAYS

PROPOSED WORK

Calif., Bakersfield—City Council agreed to sponsor construction of concrete cover for East Side canal, the top of cover to be covered with gravel to form a roadway. $35,000. Work must start at once while canal is dry. W.P.A. project. J. Holfelder, City Hall, engr.

★ **Calif., Los Angeles**—Harbor Dpt., City Hall, A. Eldridge, genl. mgr., have been assured federal grants totaling $1,001,394 for harbor improvements, of this amount $509,907 was allocated Dec. 17, the remainder of $491,487 to be appropriated at a later date for development of Terminal Island Airport for use of the Navy. At the time of approval of the above P.W.A. officials announced the formal withdrawal of the original loan and grant of $8,963,636 for general harbor improvements because of failure of $7,700,000 bond issue Nov. 19. The above allotment to be employed as follows: Cargo Terminal, Berth 147, $91,636, est. cost $196,245; Belt line track extension $117,818, est. cost $270,637; passenger and cargo terminal, Pier A, $148,090, est. cost $304,747; relocate transit shed, Berth 155, $22,909, est. cost $60,916; dredging harbor, $128,454, est. cost $231,404. The P.W.A. also has approved three additional harbor projects costing $3,677,908, for which a federal grant of $2,177,908 has been requested. These include First St. passenger and cargo terminal, $1,541,454; 7th St. terminal, $1,651,000; and ferry landing facilities on main channel, $485,454. Noted Dec. 23, C. D.—Dec. 26, E. N.-R.

Calif., Newport Beach—City Clerk received no bids Dec. 23, for constructing 490 lin.ft. wooden sheet piling bulkhead inside of harbor entrance to Newport Bay. $18,000. Will readvertise. R. L. Patterson, City Hall, engr. Noted Dec. 16, C. D.

Calif., San Francisco—Bd. Supervs. City and San Francisco Co., approved agreement between San Francisco Bay Exposition Co. and city, defining area from which dredged material will be taken to fill Yerba Buena Shoals, approximately 18,000,000 cu.yd. material is involved. Work will be financed in part with W.P.A. funds. Noted Nov. 1, C. D.—Nov. 7, E. N.-R.

★ **Calif., Santa Ana**—Orange Co. Flood Control Dist., defeated bonds Dec. 19, construction of dams on the Santa Ana River at Prado, on Brea Creek, San Juan Creek, Carbon Creek, Trabucco Creek and Aliso Creek and raising Santiago Canyon Dam. $13,190,000. P.W.A. grant of $6,570,000 was contingent upon passage of bonds. M. N. Thompson Court House, engr. Noted Dec. 10.*C. D.—Dec. 19, E. N.-R.

†Idaho, Fort Hall — Bureau Indian Affairs, Wash., D. C., preliminary plans improving regulating residence, $150,000; reservation syphon, $40,000; North Canal Diversion, $28,000; Blackfoot River Channel, $85,000; Idaho Canal, $12,000; distribution system, $45,000; repairing buildings and ground, $10,000, for Fort Hall Indian Reservation. Total $450,000.

†Ill., Rock Island—U. S. Eng., rejected bids Dec. 6, constructing 2 lock tenders' residences and garages at Locks 10, 11, 16, 20 and 21. Will readvertise. Noted Nov. 13, C. D.—Nov. 21, E. N.-R.

Mass., Oak Bluffs—Town, J. Miller, clk., Town Hall, plans pile and timber bulkhead.

Minn., Minneapolis—City plans extending rein.-con. harbor wall, in Mississippi River to serve barge unloading at municipal wharf. $70,000. F. T. Paul, city engr.

N. Y., Riverhead—Supervs. Suffolk Co. plans bulkhead jetty in Shinnecock Canal. $127,000 W.P.A. grant. $155,886 appropriated by county.

Pa., Erie—Dpt. Forests & Waters, Harrisburg, T. Buchanan, secy., plans improving 2 canal basins at foot of State St. incl. dredging and constructing dock piling. $400,000. **Maturity in spring.**

†Tex., Galveston — U. S. Eng., Galveston, plans constructing 13 groins to stop erosion, $100,000.

Wash., Mt. Vernon—Drainage Dist. 15 making plans drainage, diking. $30,000. L. J. Wright, 11th and Section Sts., engr.

BIDS ASKED

†Md., Annapolis—Jan. 29, by Yards & Docks, Navy Dpt., at office Sup. Archt., Wash., D. C., constructing bulkhead wall, Spec. 7949.

N. Y., Illion—See "Contracts Awarded."

†Tennessee—See "Contracts Awarded."

LOW BIDDERS

★ **†Louisiana**—U. S. Eng., New Orleans, Dec. 30, from McWilliams Dredging Co., Pennia Bldg., New Orleans, 1,040,000 cu.yd. work, Item W 82-A, Dauterive-Fish Island Levee, $373,360; 1,600,000 cu.yd. Item W 82-B $574,440; 1,290,000 cu.yd. Item W 82-C levee, $463,110; 1,170,000 cu.yd. Item W 82-D same levee, $420,030. Noted Dec. 17, C. D.

CONTRACTS AWARDED

†Arizona — Bureau Reclamation, Federal Bldg., Yuma, constructing siphons structures at 120 Wash, 424 Wash, unnamed wash and Picacho Wash, in California, on All American Canal, to Frazier-Davis Co., 1319 Missouri Bldg., St. Louis, Mo., $489,527. Bids Nov. 25, awarded Dec. 17. Noted Dec. 10, C. D.—Nov. 7, E. N.-R.

†Ariz., Nogales — International Boundary Comn., 627 1st Natl. Bank Bldg., El Paso, Tex., constructing main channel and settling basin, Unit 3, to T. A. Allen Constr. Co., Central Bldg., Los Angeles, Calif., $7,634. Bids Dec. 2. Noted Oct. 23, C. D.—Oct. 31, E. N.-R.

†Calif., San Diego—Yards & Docks, Navy Dpt., Wash., D. C., dredging Naval Operating Base, to Sparkes & McClellan, Inc., 2610 Central Ave., Newport Beach, $44,650.

†Delaware and Maryland—U. S. Eng., Federal Bldg., Pittsburgh, Pa., reconstructing 3 highway bridges over Inland Waterways, from Delaware River to Chesapeake Bay, to Wisconsin Bridge & Iron Co., 5023 North 35th St., Milwaukee, Wis., $174,324.

†Idaho and Oregon — Bureau Reclamation, Ontario, Ore., earthwork and structures on Ward Main Drainage and Ward Drain, near Nyssa, Ore., and earthwork, structures on North Canal Laterals, near Ontario, for Owyhee Reclamation Project, to J. A. Tarteling & Sons, Boise, Idaho, $15,076 and $19,396 respectively. Bids Oct. 18, awarded Dec. 12. Noted Nov. 1, C. D.—Oct. 10, E. N.-R.

Idaho, Bonners Ferry—Kootenai Valley Drainage Dists., c/o O. C. Wilson, atty., rehabilitating drainage projects, incl. right-of-way, dyke reconstruction, drain ditch excavation, division ditches, pumping units, etc., to Morrison-Knudsen Co., 319 Bway., Boise, Idaho, $183,165. **P.W.A.** Bids Nov. 8.

Ia., Council Bluffs — City, City Hall, constructing concrete lined ditch, 5,825 ft. long with walls 10 ft. high, Sect. 3, Indian Creek Flood Control Project, to Kerns Constr. Co., Council Bluffs, $400,700. **P.W.A.** Bids Dec. 11. Noted Dec. 4, C. D.

Mass., Wareham—Town, T. A. Robinson, chn. Bd. Selectmen, Town Hall, timber bulkhead and retaining wall, backfill, water supply and drainage system, at Onset in town of Wareham, to Chas. I. Hosmer, Inc., 87 Prospect St., Greenfield $53,673. **P.W.A.** Bids Dec. 5, awarded Dec. 17. Noted Dec. 17, C. D.

†Montana — Bureau Reclamation, Dpt. Interior, Fairfield, constructing Mill Coulee Wasteway and Laterals on Greenfields and Sun River Slope Divisions, Sun River Reclamation Project, to T. G. Rowland, Salt Lake City, Utah, $43,530. Bids Dec. 2, awarded Dec. 23. Noted Dec. 10, C. D.—Nov. 21, E. N.-R.

N. M., Carson—Carson Reclamation Dist., W. K. Shupe, secy., constructing storage dam and main canal improvements, to Dinkin Constr. Co., Carson, $28,678. **P.W.A.** Bids Oct. 8. Noted May 16, C. D.—May 23, E. N.-R.

N. Y., Illion—Bd. Village Trustees, Village Hall, relocating Steel Creek Channel, for 800 ft., grading surrounding territory and relocating Short St., relief labor. $50,052. W.P.A. Noted Aug. 16, C. D.—Aug. 22, E. N.-R.

†Ore., Baker—Bureau Reclamation, Dpt. Interior, Vale, constructing Unity Dam on Burnt River, to J. A. Terteling & Sons, Boise, Idaho, $273,989. Bids Nov. 30. Noted Dec. 5, C. D. —Nov. 21, E. N.-R.

★ **†Tennessee**—Tennessee Valley Authority, Knoxville, constructing Chickamauga Dam, 5,685 ft. long, 7 mi. upstream from Chattanooga, by own forces. Est. $32,000,000. L. G. Warren, constr. engr. in charge.

★ **Tex., Edinburg**—Hidalgo Bd. Water Control Impvt. Dist. 1, c/o H. Heindemann, pres., Edinburg, irrigation improvement, to R. W. Briggs & Co., Pharr, $492,300. Est., $500,000. **P.W.A.** Noted Dec. 23, C.D.

★ **†Wash., Yakima** — Bureau Reclamation, Yakima, constructing Tunnels 1, 2, 3 and 4 Yakima Ridge Canal, for Roza Irrigation Project, to Morrison-Knudsen Co., 319 Bway., Boise, Idaho, $993,839. Bids Dec. 3. Noted Dec. 10, C. D.

★ **†Wyo., Riverton**—Bureau Reclamation, Dpt. Interior, constructing Tunnels 1, 2 and 3, Shoshone Canyon Conduit, Heart Mountain Division, Shoshone Project, to Utah Constr. Co., Ogden, Utah, $614,509. Bids Dec. 2. Noted Dec. 12, C. D.

★ **†Wyo., Riverton**—Bureau Reclamation, Dpt. Interior, constructing Bull Lake Dam, Riverton Irrigation Project, to J. S. Groves & Sons Co., 507 West Temple Bldg., Minneapolis, Minn., $653,397. Bids Dec. 7. Noted Dec. 16, C. D.

FEDERAL POWER COMMISSION

Applications for Licenses and Permits

Licenses

1350—W. L. Leland, Chico, Calif., wants license on unnamed tributary of Chipps Creek.

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†Federal Government.

Federal Power Comm. (Continued)

a tributary of North Fork of Feather River, in Butte and Lassen Natl. Forests.

1351—American Western Mines, Inc., of Montana, Elliston, Mont., wants license constructing transmission line in Powell Co., affecting lands in Heelna Natl. Forest.

1352—Great Western Power Co. and Great Western Power Co. of Calif., 245 Market St., San Francisco, wants license constructed power project on Butte Creek and North Fork Feather River in Plumas and Butte Counties, affecting lands in Plumas and Lassen Natl. Forests.

1353—Nevada-California Power Co., Riverside, Calif., wants license partly constructed transmission linse in Nye and Esmeralda Counties, affecting lands in Toiyabe Natl. Forest.

UNCLASSIFIED

PROPOSED WORK

Calif., Arcadia—RECREATIONAL CENTER—Los Angeles Co., Court House, plans converting Ross Field, Arcadia, into county recreational center, incl. 18 hole golf course, swimming pool, community house, tennis courts, etc. W.P.A. officials in California have approved appropriation of $490,000 to be used for above improvements. A. Jones, Court House, surv. Plans by Los Angeles County Parks & Playgrounds Dpt., J. K. Reid, supt., 240 South Broadway, Los Angeles.

Calif., Los Angeles—SUBWAY—City, City Hall, soon takes bids constructing Macy St. subway, 505 ft. long, 56 ft. roadway with 6 ft. walk on each side. $368,000. Merrill Butler, assistant city engr.

Calif., Los Angeles—TRACK EXTENSION, etc.—See "Earthwork, Irrigation, Drainage and Waterways."

Conn., New Britain—DAM, etc.—City, P. Wks. Dpt., plans clay core wall dam about 300 ft. long at Stanley Swimming Pool and concrete, stone retaining walls, replacing 3 bridges and pointing administration building. $25,000. G. Molleur, City Hall, engr.

Florida—RAILWAY EXTENSION—Seaboard Air line Ry., Charlotte and Granby Sts., Norfolk, Va., plans railway extension, from Plains to Lake Istokpoga. To exceed $40,000.

Illinois—RURAL ELECTRIFICATION—Suburban Electric Co., Dunlap, plans constructing 100 mile rural electrification in Knox, Peoria and Stark Counties. $80,000.

La., Monroe—SWIMMING POOL—City plans 125x250 ft., concrete, tile pool, 576 lockers, wading pool, brick, rein.-con. building with tile roof, special filtration plant to pool. $120,000. W.P.A. project. W. I. Neel, Monroe, engr.

†**La., New Orleans**—COAL BURNERS—Yards & Docks, Navy Dpt., Wash., D. C., will not repair coal bunkers in floating drydock. Project cancelled. Work will not be done at present time.

Minn., Rochester—SWIMMING POOL—City, c/o Park Bd., A. R. Nachreiner, ch., plans 60x300 ft. swimming pool and bath house at Soldiers Field. $60,000. P.W.A. grant allotted. Will hold special election for $35,000 bonds. H. V. Feehan, 1004 Marquette Ave., Minneapolis, engr.

Miss., Corinth—AIRPORT—City making plans constructing modern airport. $44,000. W.P.A. project. Crosby & Sherman, Jackson, engrs.

★ **Mo., St. Louis**—PARK—City, B. F. Dickmann, mayor and U. S. Government, c/o U. S. Territorial Memorial Expansion Comn., and National Park Service, Wash., D. C., plan constructing Thomas Jefferson Memorial on river front between Eads and municipal bridges east of 3rd St. $3,450,000 P.W.A. grant and $3,300,000 W.P.A. grant allotted. City to sell $2,250,000 bonds. Total cost $30,000,000. Le Beaume & Klein, 315 North 7th St., St. Louis, advising archts. Noted Sept. 17, C. D.—Sept. 19, E. N.-R.

Nebraska — RURAL ELECTRIFICATION — Burt Co. Rural Power Project Dist., Tekamah, made preliminary plans rural electrification. $400,000. Henningson Eng. Co., Union State Bank Bldg., Omaha, engrs.

Nebraska—RURAL TRANSMISSION LINES—Nebraska Power Co., 17th and Douglas Sts., Omaha, plans constructing rural transmission line. Est. about $25,000. F. E. Smith, Omaha, ch. engr. State Railway Comn. granted authority.

Neb., Omaha—BRAKE TESTING STATION—City, H. Knudsen, comr., City Hall, constructing and equipping brake testing station. $50,000. Applied for $30,000. W.P.A. funds.

★ **N. J., Jersey City** — PORT TERMINAL — Foreign Trade Zones Associates, 74 Trinity Pl., New York, plans by R. C. Lafferty, archt. and engr., 25 West 44th St., New York, free port terminal in Greenville Section. $50,000,000. Noted Dec. 26, C. D.—Jan. 2, E. N.-R.

★ **New York** — TUNNEL—Queens Midtown Tunnel Authority, A. B. Jones, chn., 10 East 40th St., New York, tentatively allotted $58,465,000 by P.W.A. (subject to state legislation), for proposed tunnel under East River, connecting Manhattan, Queens and Brooklyn Boros. $47,130,000 loan and $11,235,000 grant. O. Singstad, 111 8th Ave., New York, consult. engr. Noted Jan. 3, C. D.—May 9, E. N.-R.

New York—VENTILATING EQUIPMENT, etc.—Bd. Transportation, J. H. Delaney, chn., 250 Hudson St., New York, rejected bids Nov. 22, furnishing, installing ventilating equipment for Line D, and telephone and emergency alarm equipment for portion Independent City-Owned Rapid Transit R. R. Noted Nov. 25, C. D.

N. Y., Lockport—STADIUM—City, N. W. Goehle, supt. Parks, plans brick, stone, concrete municipal stadium, incl. 60x200 ft. municipal swimming pool in rear. $60,000. P.W.A. project. J. Frehsee, city engr.

N. Y., Long Island City—FILTER HOUSE—Dpt. Parks, Arsenal Bldg., Central Park, New York, plans by A. Embury, c/o owner, constructing 1 story, 61x162 ft., brick filter house, for swimming pool, Barclay St. near 23rd Dr. $125,000.

N. Y., New York—CREMATORY—Riverside Crematory, Inc., 16 Van Corlear Ave., will not build crematory, Commerce and Sedgewick Aves. $28,000. Project abandoned. Noted Sept. 27, C. D.—Oct. 3, E. N.-R.

N. Y., New York—PARK PAVILION—Dpt. Parks, Arsenal Bldg., Central Park, plans by A. Embury, c/o owner, 1 story, park pavilion, Avenue B and 10th St. $75,000.

Tex., Dallas — EXHIBIT — Texas Co., 720 San Jacinto St., plans exhibit at Texas Centennial Fair. $75,000. Private plans.

Tex., Port Lavaca—OIL PIPE MAIN—See "Public Buildings."

Wash., Bellingham — AIRPORT — Whatcom Co. plans clearing, grubbing, levelling and draining ground for municipal airport at Bellingham west of Pacific Hy., providing road to reach the site, together $169,684, and hangar $17,861. Est. $187,545.

Wash., Centralia—PARK—City plans improving Borst Park, incl. construction grandstand, swimming pool, bath house, athletic field and golf course. $125,615. W.P.A. project.

Wash., Everett—City, City Hall, plans completing development Memorial Park by constructing 18-hole golf course, clearing 10 acre picnic ground, constructing baseball field and six tennis courts. $56,043. W.P.A. approves funds. G. G. Paine, City Hall, engr.

Wash., Seattle—GOLF COURSE—City plans constructing 18 hole West Seattle golf course, incl. water system, 14,000 ft. 4- to 6-in. c.i. pipe, 8,000 ft. 1¼- to 2-in. galvanized steel pipe; drainage; 14,000 ft. 2- to 4-in. clay tile pipe. $250,000. W.P.A. funds allotted. W. C. Hall, Jr., 14th and Battery Sts., park engr.

B. C., Jordan River—WATER POWER—B. C. Electric Ry. Co., Victoria and Vancouver, plans survey of water power at Loss Creek, near here, and have applied for license to use 140 cubic second ft. and to store 14,000 acre ft. of water out of Loss Creek. E. E. Carpenter, 425 Carroll St., Vancouver, engr.

B. C., Kelowna—OIL and GAS DEVELOPMENT—Kelowna Oil & Gas Co. Ltd., plans development. $250,000.

B. C., Vancouver—MINES—Silbak Premier Mines Ltd., plans development of mines. $300,000.

N. B., Saint John—LINE EXTENSION—New Brunswick Telephone Co., 104 Union St., plans extending line 15 mi. from Harvey to Lake George. O. J. Fraser, engr.

N. S., Dartmouth—FERRY DOCKS—Dartmouth Ferry Com. making plans and takes bids in spring for extensive repairs to Halifax and Dartmouth Ferry Docks. $50,000.

N. S., Truro—ELECTRIC LINE—Bd. Electric Comrs., J. H. Slackford, chn., making plans constructing line extension from Princeport to Delma.

Ont., Kingston — STUDIO — Kingston Broadcasting Co. Ltd., c/o B. G. Robertson, 67 Clarence St., plans studio. $40,000.

Ont., Morrisburg — DOCK — Morrisburg-Waddington International Ferry 248 Slater St., Ottawa, G. D. Howith, vice-pres. and genl. mgr., plans constructing 240 ft. dock, 30 ft. wide, 70 ft. front, also 1½ story building for company and chamber of Commerce offices, and 1 story building for customs purposes.

Que., Comeau Bay—POWER DEVELOPMENT—See "Industrial Buildings."

BIDS ASKED

Louisiana—OIL DEVELOPMENT—See "Contracts Awarded."

N. Y., Dansville—AIRPORT—See "Contracts Awarded."

New York — VENTILATION BUILDING — Jan. 30, by Port of New York Authority, 111 8th Ave., New York, F. C. Fergerson, chn., constructing New York River Ventilation Building for Midtown Hudson Tunnel, Contr. MHT-10, adv. E. N.-R., Jan. 9. P.W.A. project.

O., Miamisburg — SWIMMING POOL — See "Contracts Awarded."

Okla., Frederick—SWIMMING POOL, etc.—See "Contracts Awarded."

†**Virgin Islands, St. Thomas**—AIRPORT—Jan. 22, by Yards & Docks, Navy Dpt., Wash., D. C., constructing aviation facilities, Spec. 8127.

CONTRACTS AWARDED

Calif., Oakland—WHARF EXTENSION—City Port Comn., constructing 604 ft. wharf extension, creosoted apron, concrete bulkhead wall, etc., to A. W. Kitchen, 110 Market St., San Francisco, $206,747. Bids Dec. 9, awarded Dec. 12. **P.W.A.** Noted Dec. 19, C. D.

Idaho, Sandpoint — POLE LINE — Northern Idaho Rural Electrical Rehabilitation Assn., Inc., Sandpoint, constructing 40 mi. pole line, to J. C. Roberts, 1424 13th St., Spokane, Wash., $37,313.

Louisiana — OIL DEVELOPMENT — Shell Petroleum Corp., Shreveport, development of oil properties on 80 acre tract Rodessa Oil Fields, Caddo Parish, day labor and separate contracts. To exceed $100,000. Noted Dec. 11, C. D.—Dec. 19, E. N.-R.

Mass., Danvers—FIRE ALARM SYSTEM—Commonwealth of Massachusetts, Dpt. Mental Diseases, State House, Boston, installing fire alarm system at Danvers State Hospital (Hawthorne), to Holtzer Cabot Electric Co., 125 Amory St., Jamaica Plain, Boston, $23,943. Bids Nov. 29, awarded Dec. 17. Noted Dec. 9, C. D.—Oct. 17, E. N.-R.

Mass., New Bedford—PIER EXTENSION—City Superintendent of Buildings, constructing 92x126 ft. concrete piles on and concrete deck extension to Pier 3, to Frank C. Taylor, Inc., Middle St., Fairhaven, $36,746. Bids Nov. 26, awarded Dec. 27. **P.W.A.** Noted Dec. 9, C. D.—Nov. 21, E. N.-R.

N. J., New Brunswick—FIELD TRACK—Rutgers University, landscaping, grading, laying out field track, day labor and separate contracts. About $400,000. Noted Nov. 29, C. D.—Dec. 5, E. N.-R.

New York—STATION FINISH—Bd. Transportation, J. H. Delaney, chn., 250 Hudson St., New York, constructing station finish work for 75th Ave. Union Turnpike-Kew Gardens and Van Wyck Blvd. Station for Rapid Transit R. R., Route 106, Sects. 8 and 9, to Meads Eng. Co., 217 West 14th St., New York, $207,000. **P.W.A.** Bids Nov. 8. Noted Nov. 12, C. D.

New York — TRACK BONDING, etc. — Bd. Transportation, J. H. Delaney, chn., 250 Hudson St., New York, D.C. connections and track bonding for part of Independent System, to H. Z. Altberg, 1776 Bway., New York, $268,000. **P.W.A.** Bids Nov. 12. Noted Nov. 14, C. D.—Oct. 31, E. N.-R.

N. Y., Brooklyn — STATION FINISH — Bd. Transportation, J. H. Delaney, chn., 250 Hudson St., New York, constructing station finish work for Clinton-Washington Ave., and Myrtle-Willoughby Aves., and Flushing Ave. Stations, Independent City-Owned Rapid Transit R. R., to Meads Eng. Co., 217 West 13th St., New York, $316,400. **P.W.A.** Bids Nov. 26. Noted Nov. 27, C. D.—Nov. 21, E. N.-R.

N. Y., Dansville—AIRPORT IMPROVEMENT—Village of Dansville and town of North Dansville, installing heating equipment in hangar and complete constructing runways at municipal airport, day labor. $30,269. **W.P.A.** Noted Aug. 1, C. D.—Aug. 8, E. N.-R.

N. Y., Rochester—RAILROAD IMPROVEMENTS—New York Central R. R. Co., J. W. Pfau, ch. engr., 466 Lexington Ave., New York, constructing railway electric interlocking switches, for use in grade crossing program, to General Railway Signal Co., 230 Park Ave., New York, $300,000.

O., Miamisburg — SWIMMING POOL — City 75x165 ft. pool-bath house, 32x116 ft., 1 and 1½ story, basement of rein.-con., dance floor on roof. W.P.A. labor, $55,000. R. T. Parrish, Dayton, archt.

O., Mingo Junction—STADIUM—City, general contract constructing school stadium, to Johnston Lumber & Supply Co., Steubenville, $58,394. **P.W.A.**

Okla., Frederick—SWIMMING POOL, etc.—City, constructing 80x160 ft. swimming pool and 44x70 ft. stucco boat house, W.P.A. forces, $30,000. J. J. Zumwalt, Frederick, engr.

Okla., Oklahoma City—ZOO—City, constructing animal zoo in Lincoln Park, W.P.A. labor, $50,000 appropriation made. D. J. Gordon, 717 West 7th St., engr.

★ **Pa., Phila.**—AIR BREAK EQUIPMENT—Pennsylvania R.R., Broad St. Station, T. J. Skillman, ch. engr., air brake equipment to Westinghouse Air Brake Co., 5001 Center Ave., Pittsburgh. Est. $1,500,000.

★ **Pa., Pittsburgh**—SWIMMING POOL—R. G. Woodside, controller Allegheny Co., general contract for swimming pool, North Park, Contr. 1, to John Carson & Co., 1301 Fulton St. N.S., $289,700***Contr. 2, plumbing, to John A. Galbreath, 606 Herron Ave., $47,500***Contr. 3, electrical work, to Morris Eng. Co., 108 Smithfield St., $16,906***sewage disposal plant, to H. Butch, 2 Emma St., $26,285***roadways and parking area, to John Kirch & Son, 830 Brockett St. N.S., $122,965. Grand total $503,357. Noted Dec. 23, C. D. Awards let pending P.W.A. approval.

S. C., Greenville—STADIUM—City, Park and Tree Comrs., municipal stadium, to Morris McCoy Building Co., Greenville, $82,456. **P.W.A.** Noted Nov. 20, C. D.—Nov. 28, E. N.-R.

Tex., Pharr — PIPE LINE — Murchison & Closuit, Pharr and Dallas, constructing 80 mi. 12 in. c.i. welded joint oil pipe line from Sam Fordyce Fields to irrigation districts, to Freddell Constr. Co., Houston and Corpus Christi, $100,000. Est. $125,000. Private plans.

Wash., Seattle — FISH LADDER — Puget Sound Power & Light Co., 7th and Olive Sts., constructing 270 ft. rein.-con. fish ladder, 20 ft. wide, at Rock Island power plant in Columbia River. $175,000. Work being done under supervision of Stone & Webster Eng. Corp., engrs., Central Terminal Bldg., engrs.

†**T. H., Oahu** — POWER LINE — Yards & Docks, Navy Dpt., Wash., D. C., overhead

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†*Federal Government.*

Unclassified (Continued)

power line to rifle range at Puuloa and Fort Weaver, to M. W. Moody, P. O. Box 291, Honolulu, $1,846.

MATERIALS AND EQUIPMENT

PROPOSED WORK

†DIESEL ENGINE DRAG LINE—**Los Angeles, Calif.**—U. S. Eng., 751 South Figueroa St., rejected bids Nov. 20, constructing 1 Diesel engine driven, crawler type, drag line, 2¼ cu.yd. capacity with drag-shovel or trench hoe attachment.

FIRE TRUCK — **Orland, Calif.** — City plans purchasing motor fire truck. To exceed $1,000.

LUMBER—**Oakland, Calif.**—J. H. Kimball, secy. East Bay Municipal Utility Dist., 512 16th St., rejected bids Dec. 11, 72,000 lin.ft. rough Oregon pine lumber. Proposal 704. Will readvertise.

TRUCKS—**Hartford, Conn.**—City, Bd. Contr. & Supply soon takes bids for 15 trucks to complete motorization of ash and rubbish collection system. $40,000. Funds appropriated.

VALVES—**Northboro, Mass.**—Town, H. M. Peinze, chn. Bd. Selectmen, Town Hall, soon purchases valves for use in connection with P.W.A. waterworks system construction. $1,600. P.W.A. project.

STEEL TANKS, etc.—**Buffalo, N. Y.**—C. J. Dobush, 825 Bway., plans installing 500 gal. steel tanks and electric pump at service station, 827 Bway. To exceed $1,000.

STEEL TANK—**Buffalo, N. Y.**—Marine Trust Co., Marine Trust Bldg., taking bids steel tank for gasoline storage for service station, Hertel and Wallace Aves. Pure Oil Co., Ellicott Bldg., lessee. To exceed $1,000.

TANKS—**Buffalo, N. Y.**—Tidewater Oil Co., 17 Battery Pl., New York, 1522 Maurice St., Buffalo, soon purchases steel gasoline storage tank for service station, at Michigan Ave. and Cherry St. To exceed $1,000.

SIGNAL LIGHTS—**Jamestown, N. Y.**—Dpt. P. Wks., City Hall, plans purchasing traffic signal lights. $11,075. L. L. Graham, dir.

TANK—**Jamestown, N. Y.**—Sinclair Refining Co., 205 East 42nd St., New York, will soon purchase gasoline storage tank for service station at Forest Ave. and Superior St. To exceed $1,000.

PUMP—**Oswego, N. Y.** — Common Council will purchase pumper for Oswego Fire Dpt. $14,000. R. G. Cullivan, mayor.

FIRE FIGHTING APPARATUS—**Perry, N. Y.** Bd. Village Trustees will soon purchase motorized fire fighting apparatus. $3,500. C. H. Link, ch. Fire Dpt.

TANK—**Schenectady, N. Y.**—L. M. Cutler, Bway. and Perry St., will purchase steel gasoline tank, for service station, Bway. and Perry St. To exceed $1,000. Texas Oil Co., 135 East 42nd St., New York, lessee. Construction, to A. V. Magee, 1277 State St.

FIRE APPARATUS—**Utica, N. Y.**—City, City Hall, will purchase one 75 ft. aerial truck and one 1,000 gal. combination pumper. To exceed $1,000.

TANKS — **Utica, N. Y.** — Richfield Oil Co., Devereaux Bldg., will soon purchase new tanks for gasoline service station, Genesee and Broad Sts. To exceed $1,000.

STEEL TANK—**Watertown, N. Y.**—L. A. Walrath, Evans Mills, will purchase gasoline tank for service station, Washington and Chestnut Sts. To exceed $1,000. E. C. Smith, Elsmere, engr.

STEEL TANKS—**Wellsville, N. Y.**—Sinclair Refining Co., 205 East 42nd St., New York, will soon purchase steel gasoline tanks for service station, North Main and West State Sts. To exceed $1,000.

FIRE FIGHTING EQUIPMENT—**Port Hood, N. S.**—Municipality interested in prices of fire fighting equipment.

SNOW PLOUGH EQUIPMENT—**Fort William, Ont.**—C. B. Symes, city engr., plans purchasing snow plough equipment. $7,000 available.

BIDS ASKED

GRADERS—**Sacramento, Calif.**—State Purchasing Agent, State Capitol, Sacramento, taking bids furnishing six 8 ft. leaning wheel road graders without scarifier and six 8 ft. graders with scarifier.

HARDWARE, etc.—**San Francisco, Calif.**—T. A. Brooks, city purch. agt., City Hall, taking bids furnishing hardware and castings for period starting Jan. 1 to June 30.

TRUCK—**Suisun, Calif.**—W. T. Gregor, secy. Suisun Co. Fire Protection Dist., Court House, Fairfield, taking bids furnishing motor fire truck. To exceed $1,000.

PORTLAND CEMENT, etc.—**Rensselaer, Ind.**—Jan. 14 by Bd. Comrs. Jasper Co., 2,500 bags Portland cement; 3,000 lb. reinforcing steel; 25,000 B.F.M. 3 in. creosoted bridge lumber; 30,000 B.F.M. oak bridge lumber; 3,400 ft. culvert pipe; 6,000 lb. steel beams and channels; 13,000 ft. drain tile. E. D. Nesbitt, Rensselaer, co. engr.

†STORAGE TANK—**Eastport, Me.**—Jan. 13, by U. S. Eng., Eastport, furnishing, erecting fuel oil storage tank. Spec. 284-36-346.

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†CONCRETE AGGREGATE—**Vicksburg, Miss.**—Jan. 23, by U. S. Eng., Box 665, Vicksburg, light weight concrete aggregate for use as bed load material in hydraulic river models at U. S. Waterways Experiment Station.

†CYPRESS FLOORING—**Vicksburg, Miss.**—Jan. 31, by U. S. Eng., P. O. Box 667, Vicksburg, 10,500 ft. B.M. cypress flooring, etc.

†DUMP TRUCK—**Vicksburg, Miss.**—Jan. 20, by U. S. Eng., Vicksburg, 1 auto dump truck, 1½ ton capacity.

†LUMBER—**Vicksburg, Miss.**—Feb. 2, by U. S. Eng., Box 667, Vicksburg, creosoted lumber.

†CRAWLER TYPE TRACTORS—**Vicksburg, Miss.** — Feb. 4, by U. S. Eng., Box 667, 2 crawler type tractors.

†PINE LUMBER—**Vicksburg, Miss.**—Feb. 3, by U. S. Eng., creosoted pine lumber.

STEEL TANK—**Elmira, N. Y.**—J. J. Hassett, State Theatre Bldg., Elmira, taking bids steel tank for gasoline service station, College Ave. To exceed $1,000. Haskell & Considine, Hulett Bldg., engrs.

†BLACK IRON WIRE—**New York, N. Y.**—Jan. 13, by U. S. Eng., 39 Whitehall St., 4,000 lb. soft annealed black iron wire.

†WIRE ROPE—**Huntington, W. Va.**—Jan. 14, by U. S. Eng., 5,000 lin.ft. wire rope.

ELECTRIC HOIST—**Edmonton, Alta.**—Alberta Concrete Products Ltd., in market for electric hoist, 2 drums, size inhaul 12x30 in., outhaul 16x30 in., friction clutch and brake band.

PUMP—**Ingersoll, Ont.**—P. Utilities Comn. taking bids 1,600 g.p.m. pump. H. G. Hall, waterworks engr.

ENGINE—**Luceville, Que.**—Luceville Lumber Co. Ltd., in market for 60 hp. stationery Diesel fuel engine.

PUMPS—**Quebec City, Que.**—La Compagnie du St. Louis, 33 St. Louis St., in market for 2 gasoline pumps; Boswells Brewery Ltd., in market for 3 gasoline tanks and 3 pumps for Des Prairie St. plant.

CONTRACTS AWARDED

ARMORED CABLE—**Los Angeles, Calif.**—D. P. Nicklin, purch. agt., Dpt. Water & Power, furnishing 1,000 ft. No. 4/0 AWG 19 strand, 3 conductor rubber insulated armored cable. Spec. No. "X-1." to John A. Roebling Sons, 21 South Alameda St., $1,892. Bids Dec. 10, awarded Dec. 19.

CABLE—**Los Angeles, Calif.**—S. A. Joseph, purch. agt. Metropolitan Water Dist., 306 West 3rd St., 10,000 ft. cable 3 conductor, 2/0 2,300 volt, armored, f.o.b. Beaumont, to Anaconda Wire & Cable Co., 430 Colyton St., $11,876. Bids Dec. 16, awarded Dec. 26.

★ †CEMENT—**Los Angeles, Calif.**—U. S. Eng., 751 South Figueroa St., 266,000 bbl. portland cement, to Riverside Cement Co., 621 South Hope St., to Southwestern Portland Cement Co., 727 West 7th St.; and to California Portland Cement Co., 523 West 6th St., approximately $526,680. Bids Dec. 17, awarded Dec. 20. Noted Dec. 16.

CEMENT—**Los Angeles, Calif.**—Bd. Supervs. Flood Control Dist., 205 South Bway., 25,000 bbl. cement f.o.b. bidder's mill, for San Gabriel Dam 1, to Riverside Cement Co., 621 South Hope St., $47,500. Bids Dec. 13, C. D.

†DECOMPOSED GRANITE, etc.—**Los Angeles, Calif.**—Procurement Officer, 4,980 tons decomposed granite, for W.P.A. projects, to Owl Truck & Materials Co., 420 South Alameda St., $5,129; reinforcing steel and steel wire, to Truscon Steel Co., 5480 East Slauson Ave., $9,610.

†GATE VALVES, etc.—**Los Angeles, Calif.**—U. S. Eng., 751 South Figueroa St., gate valves, globe valves, pipe and fittings, to R. M. Hartwell Co., 353 East 2nd St., $417; 2 loading machines, to Smith-Booth-Upsher Co., 2001 Santa Fe Ave., $6,230. Bids Dec. 9. Noted Dec. 17, C. D.

†MOTOR GENERATOR SETS—**Los Angeles, Calif.**—U. S. Eng., 751 South Figueroa St., 6 each motor generator sets, gasoline engine driven, to United Motors Service Co., 1225 South Grand Ave., $16,290. Bids Dec. 13, awarded Dec. 19. Noted Dec. 27, C. D.

†PIPE—**Los Angeles, Calif.**—U. S. Eng., 751 South Figueroa St., 10,000 ft. used 2 in. and 5,000 ft. used 1 in. pipe, to Heller Pipe & Mchy. Co., 749 South San Pedro St., $1,150. Bids Dec. 2. Noted Dec. 16, C. D.

PRESSURE CREOSOTED POLES—**Los Angeles, Calif.** — D. P. Nicklin, purch. agt. Dpt. Water & Power, 207 South Bway., furnishing eighty 35 ft., two hundred and twenty-five 40 ft., one hundred and eighty 45 ft., one hundred 50 ft. pressure creosoted poles. Spec. 1842, to Texas Creosoting Co., 318 West 9th St., $9,021. Bids Dec. 9, awarded Dec. 17. Noted Dec. 5, C. D.

STEEL GUY CABLE—**Los Angeles, Calif.**—D. P. Nicklin, purch. agt., Dpt. Water & Power, 207 South Bway., 70,000 ft. ¼ in., 85,000 ft. 5/16 in. standard, and 50,000 ft. ¼ in. high strength steel guy cable. Spec. 1845, to Electric Power Specialties Co., 1001 East 1st St., $2,957. Bids Dec. 11, awarded Dec. 18.

SUSPENSION INSULATORS — **Los Angeles, Calif.**—Directors Metropolitan Water Dist., 306 West 3rd St., F. E. Weymouth, engr., 50,000 suspension insulators for 230 Kv. transmission line, to Graybar Electric Co., 301 East 8th St., $88,800. Bids Aug. 20, awarded Dec. 20. Noted Aug. 30, C. D.—June 20, E. N.-R.

TELEPHONE EQUIPMENT, etc.—**Los Angeles, Calif.** — D. P. Nicklin, purch. agt., Water & Power, 207 South Bway., one 1[illegible] tion 2 panel section manual switchboard [illegible] plete, to American Automatic Sales Co., [illegible] South Flower St., $1,134***1 lot miscellan[illegible] telephone equipment, f.o.b. Los Angeles, a[illegible] lot, same, f.o.b. Van Nuys, to Graybar El[illegible] Co., 301 East 8th St., $930. Bids Dec. [illegible] Noted Nov. 27, C. D.

†TRUCKS—**Los Angeles, Calif.**—U. S. [illegible] 751 South Figueroa St., 36 automobile tr[illegible] with cab dump body and underbody hydr[illegible] hoist, 4 cu.yd. capacity, to International [illegible] vester Co., 734 Lawrence St., Los An[illegible] $74,703. Bids Dec. 19, awarded Dec. 26.

PIPE—**Newport Beach, Calif.**—City [illegible] 210 lin.ft. 24 in. and 112 lin.ft. 18 in. [illegible] 150 c.i. water pipe, to American Cast [illegible] Pipe Co., 412 West 6th St., Los Angeles, $1[illegible] ***6,000 lb. c.i. special castings and two [illegible] in. gate valves, to Utilities Supply Co., [illegible] East 15th St., Los Angeles, $575 and $58[illegible] spectively. Grand total $2,676. Bids Dec. [illegible] awarded Dec. 23. Noted Dec. 13, C. D.

WRAPPED PIPE—**Palo Alto, Calif.**—E[illegible] Beach, city clk., furnishing wrapped pipe [illegible] follows: 1,315 ft. 8-¼ OD 7/32 in. wall s[illegible] less steel pipe, 1,120 ft. 6 in. standard s[illegible] less steel pipe, 2,580 ft. 6-¼ OD 3/6 in. [illegible] ft. 4-¼ OD 3/16 in. and 750 ft. 3-¼ OD [illegible] wall seamless steel pipe; 250 ft. 6-¼ OD [illegible] in., 100 ft. 4-¼ OD 3/16 in. and 100 ft. [illegible] om/P/D ¼ in. wall seamless steel black pipe [illegible] Pacific Pipe Co., 201 Folsom St., San Franc[illegible] $7,550 with McEverlast wrapping. P.W.A. [illegible] Bids Dec. 11, awarded Dec. 16. Noted [illegible] 5, C. D.

CABLE—**San Francisco, Calif.**—T. A. Bro[illegible] city purch. agt., 18,900 ft. lead covered [illegible] Bid 1489, to J. A. Roebling's Sons, 646 Fol[illegible] St., as follows: 13,900 ft. 12-pair, at 13.3[illegible] per lin.ft. and 5,000 ft. 6-pair at 9.24c. [illegible] lin.ft. Bids Dec. 6, awarded Dec. 20.

QUARRY WASTE—**San Francisco, Calif.** — T. A. Brooks, city purch. agt., City Hall, [illegible] 000 cu.yd. quarry waste, macadam mat[illegible] for Work Relief Projects, Bid UR 1484, [illegible] City and San Francisco Co., to San Franc[illegible] Paving Co., 6565 3rd St., 25c. per cu.yd. Bids Nov. 25, awarded Dec. 17.

†IMPELLERS — **Kansas City, Mo.** — U[illegible] Eng., 232 Mfg. Exch. Bldg., 4 steel impel[illegible] to Ellicott Machine Corp., 1611 Bush St., Ba[illegible] more, Md., $3,360. Bids Dec. 12, awarded [illegible] 23. Noted Dec. 30, C. D.

†STEEL PIPE — **Kansas City, Mo.** — U[illegible] Eng., 232 Mfg. Exch. Bldg., furnishing st[illegible] pipe, f.o.b. contractors plant, to McClin[illegible] Marshall, Leetsdale, Pa., $7,667. Bids Dec. [illegible] awarded Dec. 24. Noted Dec. 26, C. D.

†LAND PIPE for DREDGES — **Montana** — U. S. Eng., Kansas City, Mo., 28 in. land pipe for dredges for Fort Peck Dam, to Treadwell Constr. Co., Midland, Pa., $51,312.

FILTER ALUM—**Trenton, N. J.**—City Co[illegible] cil, filtered alum (standard), for waterwor[illegible] to R. E. Carroll, Inc., Broad St. Bank, $4,2[illegible] est. $4,290; lead lined pipe and fittings, to Manufacturing Co., 80 North Olden Ave., $1[illegible] 033. Noted Oct. 11, C. D.—Oct. 17, E. N.-R.

STONE, etc.—**Trenton, N. J.**—City Manag[illegible] stone and stone dust, to Lambertville Trap Rock Co., River Rd., Lambertville, $7,215*** gravel, to Rednor & Kline, Morrisville, Pa., $496***stone screenings, to J. T. Dyer Quarry Co., Commercial Trust Bldg., Phila., Pa., $5[illegible] ***stone, to Kingston Trap Rock Co., Kingston, $8,325; Portland cement, to Tattersall [illegible] 100 West End Ave., $14,583***chain link fence, to Standard Supply & Equipment Co., 143 North Warren St., $2,109***tar, to Barrett Paving Co., 28 West State St., $1,[illegible] ***iron and steel products, to Igoe Bros., [illegible] Poinier St., Newark, $1,268. Grand total $36,379.

STEEL RAILS—**New York, N. Y.**—Long Island R.R. Co., A. C. Watson, ch. engr., Pennsylvania Station, 1,000 tons steel rail, to Bethlehem Steel Co., Bethlehem, Pa. Owner will place rail by day labor and separate contract.

CAST IRON PIPE—**Cincinnati, O.**—City, E. Lex. purch. agt., 1,056 ft. 6 in. and 9,312 ft. 8 in. c.i. water pipe, to U. S. Fdry. Co., Addyston, $12,155. Noted Nov. 29, C. D.

CAST IRON PIPE — **Cincinnati, O.** — City furnishing to Dpt. Water, 49,200 ft. 4- to 12-in. cast iron pipe, to U. S. Pipe & Fdry. Co., Addyston, $52,740***40 tons more or less of special castings, to Rudisill Fdry. Co., Cincinnati, $3,096.

LOCOMOTIVES—**Cincinnati, O.**—City, furnishing oil or gasoline driven locomotives to Dpt. P. Wks., to Baldwin Locomotive Co., 1[illegible] South Broad St., Phila., Pa., $7,330. Noted Dec. 11, C. D.

PIPE—**Cleveland, O.**—A. L. Connelly Co., general contractors, 3714 Perkins Ave., [illegible] tons 30 in. spiral welded pipe for 121st St. water line, for City, to American Rolling Mill Co., Middletown.

SNOW PLOWS—**Providence, R. I.**—City, S. P. McElroy, clk., City Hall, furnishing 34 light duty snow plows, to Good Roads Mchy. Co., N.E., 15 North Beacon St., Watertown, Mass., $8,336. Bids Nov. 25, awarded Dec. 16. Noted Nov. 22, C. D.

†*Federal Government*

Materials, etc. (Continued)

REGULATOR—Tacoma, Wash.—City Light Dpt., City Hall, step type voltage regulator, 6,000 kva., to General Electric Co., Washington Bldg., Tacoma, $5,744. Est. $6,000. Noted Dec. 16, C. D.—Dec. 19, E. N.-R.

PIPE—Baraboo, Wis.—City, 1,500 ft. 6 in. and 500 ft. 2 in. Class 150 c.i. water pipe, to O. Schade & Sons, Baraboo, $1,710. Bids Dec. 18. Noted Dec. 16, C. D.

CORRUGATED PIPE—Oshkosh, Wis.—City, 1,320 ft. 24 in. 10 gage corrugated pipe, to Bark River Bridge & Culvert Co., Eau Claire, $2.21 per ft. Bids Dec. 9. G. H. Randall, city engr.

DUMP TRUCK—West Milwaukee, Wis.—Village, furnishing dump truck, to Sterling Motors Corp., 2021 South 54th St., Milwaukee, $1,200. Bids Dec. 2. Noted Nov. 27, C. D.

FOREIGN

Australia — Electric Supply Comn., **Melbourne,** in market for 22,000 volt and 6,600 volt switchgear for Naratah Place Sub-Station ***Jan. 17, by **Brisbane** City Clerk, supplying, erecting 1,500 kw. turbine alternator with direct connected exciter, rheostat and all accessories.

Australia, Queensland—Colonial Sugar Refining Co., Ltd., Sydney, plans fibre board plant, $700,000

Bolivia—Ministry of Justice, Bolivian Government, LaPaz, plans constructing Penal Institution on Island of Moon, Lake Titicaca, $500,000 or more.

British Guiana, Georgetown—Sir Alfred Sherlock plans developing colony's gold resources for 1936. $2,000,000.

Ceylon, Colombo—Dpt. Communications & Wks., to call tenders for hydro-electric power station at Poringalkutta. Thermal Station at Trickhur and Thermal Station at Ernacailan.

China—Chinese Purchasing Comn., c/o Fox & Mayo, 158 Dashwood House, Old Broad St., London, England, in market for supplying 2 grab dredgers.

Costa Rica—Goodyear Rubber Co., J. Ingle, in charge, Akron, O., constructing service, storage building on 1,000 acre rubber plantation, day labor and separate contracts. $400,000.

Egypt, Cairo — Apr. 7, by Excellency The Minister of Public Works, constructing Mohammah Alg Barrages and subsidiary works. Tenders to be obtained at Roygal Egyptian Legation, Wash., D. C.

Egypt, Cairo—State Domains Administration, in market for 19½ tons 2 mm. wire for power. Tenders should be cabled, followed by air mail details.

England—Governors of Eton College, **Eton,** plan building reconstruction scheme, $1,000,000; Mersey White Lead Co., Ltd., Great Sankey, preparing plans large factory for producing activated carbon, **Warrington.**

England—G. W. V. daRhe Pllipe Madras and Southern Mahratta Railway Co., 25 Buckingham Palace Rd., Westminster, in market for 637 tons M.S. rounds, squares, angles, and flats, and for 370 tons M.S. plates and sheets, 355 steel tires for locomotives, broad gage, 238 steel tires for locomotives, meter gage, 3,420 steel boiler tubes, and 228 steel flue tubes and solid drawn, **London**•••Wallis, Gilbert & Partners, archts., Central Chambers Buckingham, Palace Rd., **London,** preparing plans extending MacLean, Ltd., Great West Rd., Brentford••• Courtaulds, Ltd., 16 St. Martins le Grand E.C., **London,** plans silk factory at Holywell, $1,000,000•••Froch Wharf, Ltd., **London,** preparing plans new wharf and warehouses, $530,000•••C. W. Hodgson, archt., 203 Hoe St., **London,** preparing plans large factory at Walthamstow•••Gunton & Gunton, archts., Empire House, St. Martin le Grand, preparing plans plant extension for Aiet & Wiborg, Standew Rd. S.W., **London,** $650,000•••Aluminum Paint & Vessel, Ltd., **London,** plans by Wallis, Gilbert & Partners, Central Chambers, Buckingham Palace Rd., constructing plant at Point Pleasant, $600,000••• Courtaulds, Ltd., 16 St. Martins le Grand E.C., London, preparing plans constructing silk manufacturing plant at **Plymouth,** $1,250,000•••Thames Board Mills, Ltd., plans by J. Simpson, c/o Unilever, Ltd., Unilever House E.C., **London,** constructing plant at Arpley•••First National Housing Trust, 10 The Boltons S.W., **London,** preparing plans constructing 314 houses at Corby, $628,000•••J. Laing & Sons, Ltd., Mill Hill N.W., **London,** plans 770 houses at Edgware, $1,100,000••• General Housing Co., Ltd., 50 Uxbridge Rd., **London,** preparing plans 265 houses at Hexton••• Gordon Carrington Co., 1 Park Ave., **London,** preparing plans 250 houses at Hounslow, $700,000 •••University of London, **London,** constructing students hotel, to Ashby & Horner, 8 Aldgate East, $500,000, Sir Herbert Baker, Romney House, Marsham St. S.W., archt.•••**Worthing** municipality voted $5,000,000 for civic improvements, incl. constructing 200 houses, $500,000; drainage scheme, $1,000,000; and water scheme, $750,000•••**Goring** municipality votes $32,500,000 for civic improvements, incl. 27 mi. pavement, $2,500,000•••**Angmering** municipality votes $10,000,000 for civic improvements, incl. golf club house, $200,000••• **Seaford** municipality plans developing 1,000 acre estate for housing purposes•••**Southwick** municipality votes to develop 450 acre estate for housing purposes•••Scunthorpe and Frodingham Urban District Council, **Scunthorpe,** taking bids supplying and erecting electrically driven pumping plant, incl. 2 motor driven centrifugal bore hole pumps, and three horizontal motor driven turbine type force pumps, with all pipes and accessories, W. Farrar, engr.•••Chairman Fylde, Water Bd., Sefton St., **Blackpool,** in market for 4,812 lin.yd. 27 in., 3,320 yd. 25 in., 2,556 yd. 24 in. and 688 yd. 21 in. pipe, necessary castings, sluice valves and valves.

England—Ideal Houses Ltd., **Edmonton,** preparing plans constructing 294 houses, $588,000 •••**Coventry** Municipality constructing by-pass, to J. Mowlern & Co. Ltd., Ebury Bridge Rd., London, S.W., $886,805•••**Derby** Municipality constructing 392 houses to Building Wks. Department, $565,510•••India Rubber Gutta Percha & Telephone Wks. Ltd., **Silvertown,** constructing ebonite shop, to John Mowern & Co. Ltd., Ebury Bridge Rd., London, S.W., $450,000•••Bristol Marine Aircraft Ltd., **Southampton,** plans seaplane plant on 120 acre site, recently purchased, $1,000,000•••J. D. Williams Ltd., 53 Dale St., **Manchester,** plans factory, **Hulme,** $500,000•••British Aluminum Co. Ltd., Redmills Rd., prepares plans new rolling mills plant, **Stoke-on-Trent,** $800,000 •••Pick, Everard, Keay & Grismon, **Leicester,** 6 Millstone Lane, plans factory at Wolsall, for J. A. Crabtree & Co. Ltd., $610,000•••**Birmingham,** Midland Tar Distillers Ltd., Exchange Bldg., prepares plans constructing plant at Ilchester Wharf, Birkenhead, $730,000•••Morris Commercial Cars Ltd. **Birmingham,** prepares plans plant at Adderley Park, $1,250,000••• Mersey Cable Wks., Linacre Lane, **Bootle,** plans extensive plant, $815,000•••Vulcan Iron Wks. Ltd., **Patieroft,** plant addition, to N. Brookes & Sons, Eclesmere, Patieroft, $437,000. L. Knight, 5 Cross St., Manchester, archt.•••Alvis Car & Engineering Co., Holyhead Rd., **Coventry,** preparing plans factory and office, $625,000 •••H. Chippendale, Bar Grange Ave., **Shipley,** preparing plans 500 houses at Victoria Park, $857,000•••**Blackpool** Municipality voted $650,000 for constructing indoor baths•••James & Bywater, 5 Bloomsbury St., W.C., **London,** preparing plans for county building for Hartfordshire County Council, $770,000•••Boro of Stephnay, plans by Briggs & Rhornely, Royal Liver Bldgs., **Liverpool,** constructing municipal building, $600,000•••Anglican Cathedral Corp., **Sheffield,** plans by C. Nicholson, 2 New Square, Lincoln Inn, London, W.C., reconstructing cathedral, $500,000 available•••County Council of Durham, **Aycliffe,** mental institution, to A. Anderson Ltd., Newcastle-on-Tyne, $497,925 •••**Gateshead** Municipality constructing 558 houses, to J. Clark & Son Ltd., New Seahams, $980,000•••**Northampton** Municipality plans by J. Brown, 83 St. Giles St., general hospital addition•••Long Eaton Cooperative Society Ltd., **Toton,** making plans Garden City, $700,000•••Essex County Council, **Romford,** preparing plans hospitals at Romford, $500,000, and at Barking, $750,000•••Follsain Syndicate Ltd., Winchester House, A. H. Pollen, pres., **London,** preparing plans quadruple plant at Lutterworth, $500,000.

England—Warner Bros. First National Producers Ltd., **Teddington,** supplying one 450 hp. and one 600 hp. oil engines, to Ruston & Hornsby Ltd., Lincoln•••J. Hall, city archt., **Sheffield,** taking bids 378 houses at Shirecliffe, $700,000•••Glesson Development Co. Ltd., **Epsom,** plans by F. Suttop Smith, constructing 473 houses, $910,000•••Bennetts Housing Assn., **Worcester,** preparing plans 240 houses at Corn Meadow, $525,000•••Chief Engineers, Waterworks Office, City Hall, **Manchester,** taking bids constructing waterworks pump house at Abergale and supplying, installing electrically driven centrifugal pump•••Lancashire Mental Hospital Bd., **Liverpool,** voted $6,500,000 for hospital, at Latham Park. Prospective bidders should file names with secretary of bd. before Jan. 15•••London, Midland & Scottish Railway, **London,** appropriates $42,500,000 for 1936 replacements and improvements•••Metropolitan Water Bd., G. F. Stringer, clk., 173 Roseberry Ave., E.C., **London,** taking bids supplying and laying 5,532 lin.yd. 24 in. and 667 lin.yd. 18 in. steel pipe and 710 lin.yd. 12 in. c.i. pipe•••W. Towsned, Town Hall, Fulham, S.W., taking bids supplying and erecting ash removal plant, incl. ash hoppers, conveyors, etc, **London,** Preece, Cordeau & Rider, 10 Queen Anne Gates, Westminster, S.W., engrs.•••**London** County Council preparing plans rebuilding Wandsworth Bridge, $2,350,000. Prospective bidders should file names with Clerk of Council •••Mashaha Rhodesian Asbestos Co., **London,** plans development, $460,000•••Peruvian Associated Gold Mines Ltd., **London,** appropriates $835,000 for equipment of mines with electric power and other developments•••Wilcox, Raikes & Marshall, 33 St. Charles St., **Birmingham,** taking bids constructing sewerage and sewerage disposal scheme for Repton Rural Council•••Royal Buckinghamshire Hospital Bd., **Aylesbury,** extension, to Webster & Cannon Ltd., Aylesbury•••Bengers Food Ltd., **Manchester,** plans constructing plant at Holmes Chapel on 2 acres•••Sound City Ltd., **Shepperton,** constructing four 440 hp. oil engines, to Ruston & Hornsby Ltd., Lincoln.

England—Nottingham Municipality, constructing 1,369 houses, to Industrial Buildings, Ltd., Mackhill Farm, Easterly Rd., Leeds•••**Portsmouth** Municipality awards contract constructing housing, to H. E. Pitt, Ltd., Millfield, Sunderland, $511,596•••London, North Eastern R. R., **Doncaster,** prepares plans remodeling station and electrification lines, $2,500,000••• **Wathamstow** Municipality voted $1,100,000 for constructing civic center and appointed P. D. Hepworth, archt., 7 Grays Inn Pl., London••• Jan. 9, by I. M. Cule, clk., Skegness Urban Dist. Council, Town Hall, **Skegness,** supplying 7,000 lin.yds. 15 in., watermain and fittings, vertically or centrifugally c.i. pipes or steel pipe•••Smethurst Industries, Ltd., 37 Deansgate Arcade, **Manchester,** prepares plans 240 houses at Knutsford, $520,000•••A. J. Butcher, archt., 2 Express Mansions, Edgware, plans 220 houses, **Lewisham,** $509,000•••C. Ogle, Macclasfield, plans by H. McClellan, 72 Woodsmoor Lane, constructing 220 houses, **Stockport,** $600,000•••Redford & Jenkins, Macclasfield, plans by Cooke, Howard & Lane, Brunts Chambers, Leeming St., constructing 200 houses, **Manchester,** $587,000•••Wrue & Sons, 84 Bawtry Rd., Tinsley, plans by W. G. Gibbs, 22 Paradise Sq., constructing 280 houses, **Sheffield,** $721,000•••T. Pilkington, 25 Birley St., plans by E. G. Sargent, Kirkham, 240 houses, **Blackpool,** $490,000•••J. Bowers & Partners, Milburn House, Newcastle-upon-Tyne, installing coke ovens and by-products plant and coal washing plant, **Jarrow-on-Tyne,** to Birtley & Co., Ltd., est. $1,250,000•••Tungstall Steels, Ltd., Lombard House, Birmingham, purchases 50 acres for site and plans erection steel works, **Wolverhampton,** $3,000,000•••F. Holme Lister Ave., **Bradford,** plans 318 houses, $610,000••• R. F. Bartlett, Waymanor Estate, **Chatsey,** plans 387 houses, $725,000•••F. W. Goldworthy, South Lodge, prepares plans for 250 houses, **Woodfordwells,** $538,000•••Prudential Assurance Co., **Birmingham,** office building, to C. Bryant & Sons, Ltd., 65 Whitmore St., Birmingham, $500,000.

France, Nice—French Ministry making plans constructing aerodrome and diverting mouth of Var River 200 yds. to west. $2,000,000.

France, Paris — Superior Railway Council voted 1,321 million francs for 1936 expenditure in signals and electrification, rolling stock.

France, Paris—Chemin de Fer de L'Etat Directorate, bids early in 1936, electrification of 131 mi. railroad from Paris to LeMans.

Iran, Teheran—Kampsat Consortium taking bids 100 small steel bridges consisting of primary sections.

Iraq, Bagdad—District Water Bd. taking bids supplying 784 dry dial type watermeters of various sizes.

Irish Free State—Bd. Health & Public Assistance Comn., **Roscommon,** plans by J. R. Boyd Barrett, 61 South Mall Cork, for county hospital building, $525,000•••Electricity Supply Bd., **Dublin,** in market for annual supply of paper insulated cables and supply and laying 40,000 volt underground power cables throughout city.

Japan, Tokyo—Yasuke Matsuoka, pres. South Manchurian Railway, announces plans for constructing plant to produce 4,000 tons aluminum per year.

Mexico, Durango—Mexican Government, Mexico City, soon takes bids constructing irrigation dam to supply water for 2,000,000 hectacres of land. To exceed $10,000,000.

Mexico, Mexico City—Pascual Oritz Rubio & Associates, Mexico City, constructing 18 camps, each having twelve 1 story, 20x20 ft. houses for Tourist Camps, on highway between Nuevb Laredo Mexico and Mexico City to Reinforced Concrete Corp., Laredo, Tex. Est. about $100,000. H. Amescua, Laredo, Tex., engr.

Mexico, Tamaulipas — Mexican Government, Mexico City, soon takes bids irrigation dam to supply water for 250,000 hectacres. To exceed 10,000,000 pesos.

New Zealand—New Plymouth Municipality plans airport addition, $235,000•••**Waikato** Municipality plans renewing bridges, $350,000. **Canterbury** Municipality plans concrete bridge over River Rangitata.

New Zealand, Christchurch—City Clerk taking bids supply and laying 10 mi. 6 and 12 in. iron pipe.

Northern Ireland, Belfast—Natural Housing Corp. Ltd., prepares plans 350 houses at Graymount. $610,000.

Scotland—J. and R. D. Findley, **Ruthergien,** plans brickyard, mill, factory and offices at Hamilton, incl. constructing 16 chamber kilns; Scottish Agriculture Society Ltd., **Aberdeen,** plans by Jenkins & Carr, 16 Bridge St., constructing grain elevator•••MacGregor & Balfour Ltd., Logans Rd., **Dundee,** prepares plans for large extension to plant•••Fullwood Fdry Ltd., **Hamilton,** plans extensive addition; J. Lawrence Ltd., 50 Wellington St., **Glasgow,** plans 284 houses at Clarketon, $516,000.

Scotland, Glasgow — Thomas Somers, city engr., preparing plans sewerage scheme, incl. 20 mi. outfall sewers and addition to purification plant, $13,300,000; Municipality awards generating plant at Dalmarnoch, to Yarrow & Co., Ltd., Scotstown, $2,355,225.

Scotland, Glasgow — Thomas Somers, city engr., preparing plans constructing bridges during 1936, $1,556,805; also preparing plans canal aqueduct improvements, $1,500,000.

South Africa, Johannesburg—B. M. Bellasio preparing plans constructing building for Empire Exhibition. $1,500,000.

South Africa, Johannesburg—South African Railways & Harbours Administration, prepares plans floating dock at Durban Harbour. $500,000.

South Africa—Somerset West Municipality, constructing weir on Lourens River, incl. intake and screenings chamber, incl. 12 mi. 10 in. pipe, and 11 mi. 9 in. pipe to replace present 4 in. mains, also sewerage scheme, $700,000 •••**DeAar** Municipality voted watermain extensions, incl. 21 mi. piping, $390,000.

Trinidad, Port of Spain — Industrial Gases Ltd., 22 Abercromby St., in market for 120

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†*Federal Government.*

Foreign (Continued)

tons carbide, 50x80 MM. Custom duty 4 shillings per 100 lb. plus surtax of 10% of duty.

Trinidad, Port of Spain — Industrial Gases Ltd., 22 Abercromby St., in market for synthetic acetone, about 8,400 lb. annually.

Trinidad, Port of Spain — Industrial Gases Ltd., 22 Abercromby St., in market for supply of caustic potash, about 12,000 lb., to be walnut size prepared for oxygen plants for sugar estates and oil fields.

Venezuela, Monagas—Pantepec Oil of Venezuela, 405 Lexington Ave., New York, and Standard Oil Co. of Venezuela, 26 Bway., New York, oil exploration, incl. drilling series of six 6,000 ft. test wells for oil exploration, day labor and separate contracts. To exceed $150,-

Yugoslavia, Belgrade — Aluminium Works, Ltd., preparing plans plant for production of bauxite and manufacture of allied products and alloys. $1,000,000.

PUBLIC BUILDINGS

PROPOSED WORK

Calif., Alameda—City Bd. Educ. plans by H. A. Minton, Market St., San Francisco, and soon takes bids reconstructing Lincoln School, $80,-000, and Porter School, $67,000; plans by C. Werner, 1303 Bay St., San Francisco, and soon takes bids reconstructing high school, $197,000; plans by A. T. Haas, 525 Market St., San Francisco, and soon takes bids reconstructing Haight School, $70,000, and Washington School, $77,000. Plans awaiting P.W.A. approval.

Calif., Bakersfield — Kern Co. Union High School Dist., election Jan. 17, $200,000, to finance high school improvements. C. H. Biggar, Haberfelde Bldg., archt.

Calif., Chico—See "Contracts Awarded."

Calif., El Cerrito—El Cerrito Junior High School Dist. plans Junior High School. To exceed $115,000. Architect not appointed.

Calif., Long Beach—Bd. Educ., 715 Locust Ave., rejected bids Nov. 29, constructing girls' activity building, boys' gymnasium and auditorium building at Jefferson Junior High school site. $250,000. W. Dedrick, 901 Heartwell Bldg., archt.

Calif., San Francisco — Dpt. P. Wks., City Hall, rejected bids Dec. 18, general contract, mechanical and electrical work for machine shop, Bay and Fillmore Sts., for City and San Francisco Co. Noted Jan. 2, C. D.—Oct. 24, E. N.-R.

Calif., Wilmar—Garvey Schol Dist. plans by Farrell & Miller, 4549 Produce Plaza, Los Angeles, school, consisting of 4 units, a 2 story, rein.-con. structure to house 16 classrooms, library and administration offices, rein.-con. auditorium, with seating capacity of 700, frame, stucco cafeteria building and a frame, stucco shop building, $223,000. B. I. Means, 4549 Produce Plaza, Los Angeles, structural engr.

Conn., Madison—Town, Bd. Selectmen, Town Hall, revised plans by Lorenzo Hamilton, Inc., 22 Church St., Meriden, brick, steel addition to Hands Consolidated School. $105,000. P.W.A. project. Former bids rejected. Noted Dec. 19, C. D.—Dec. 5, E. N.-R.

†Ill., Chicago—Dpt. P. Wks. Administration, Housing Div., Wash., D. C., rejected bids Dec. 12, demolition of buildings and structures on site of Jane Addams Housing project. Noted Oct. 15, C. D.—Oct. 17, E. N.-R.

Ind., Covington—Bd. Comrs. Fountain Co., Z A. Helms, aud., soon takes bids constructing 3 story, brick, steel court house. $246,731. L. L. Johnson, Attica, archt. Owner plans to vote $136,000 bonds for same. P.W.A. grant of $110,731. Noted May 20, C. D.—May 23, E. N.-R.

Mass., Avon—Town, W. A. Littlefield, chn. Building Comn., Town Hall, rejected bids Dec. 5, 2 story, basement, 67x105 ft. school addition. Will readvertise. P.W.A. project. Frank Irving Cooper Corp., 47 Winter St., Boston, archts.

Minn., Rochester—City Library Bd., W. N. Churchill, pres., election Jan. 21, to vote bonds for 1 story, basement, brick, steel, library, 2nd St. and 3rd Ave. S.W. $150,000. H. H. Crawford and P. Bross, Rochester, archts.

Miss., Pace—Bd. Trustees Pace Consolidated School Dist., A. H. Ramsey, supt., rejected bids Dec. 4, 1 story, brick school, plain found. Former contract rescinded. Will readvertise. Noted Dec. 16, C. D.—Dec. 19, E. N.-R., under "Contracts Awarded."

★ **Mo., Fulton**—State Hospital 1 Fulton and Bi-Partisan Advisory Bd. of State Hospital Comn., E. M. Eagan, executive secy., Jefferson City, plans by B. J. Bradshaw, Inc., 718 Locust St., St. Louis, brick, concrete psychiatric clinic building $367,000; plans by Pleitch & Price, Arcade Bldg., St. Louis, and Gray & Pauly, 3800 West Pine Blvd., St. Louis, concrete, brick auditorium and patients' dining room, $321,000 •••plans by L. LaBeaume, 315 North 7th St., St. Louis, hospital for criminal insane, $420,-000; plans by Baumes & McDevitt, Railway Exchange Bldg., and R. Toensfeldt, Security Bldg., St. Louis, constructing power plant. P.W.A. project.

★ **Mo., Jefferson City** — Missouri State Penitentiary and Bi-Partisan Advisory Bd. State Building Comn., E. M. Eager, executive secy., Jefferson City, plans by A. Gentry, Voskamp & Neville, 4 West 13th St., Kansas City, constructing administration building cell blocks and corridors at State Penitentiary, $1,800,000; plans by J. Schaper, Jefferson City, brick, concrete warehouse, $60,000; plans by J. Shaughnessy, Reliance Bldg., Kansas City, brick, concrete dormitory building, $100,000. P.W.A. project.

★ **Mo., Kansas City**—City, plans by E. C. Gunn, 1108 National Federal Life Bldg., constructing city market, $500,000. Noted Dec. 11, C. D.—Dec. 19, E. N.-R.

Mo., Koch—Bd. P. Serv., City Hall, soon takes bids general contract 3 story, basement, 65x164 ft. ward building, on Mississippi River, south of Jefferson Barracks, $230,000. P.W.A. project. A. Osburg, city archt. W. C. E. Becker, city engr. Noted Jan. 21, C. D.—Jan. 24, E. N.-R.

Mo., Marshall — State School for Feeble Minded, Marshall and Bi-Partisan Advisory Bd. of State Building Comn., E. M. Eagan, executive secy., Jefferson City, plans constructing power plant building and equipment. P.W.A. project. Powers & Wells, 420 Security Bldg., St. Louis, engrs.

★ **Mo., St. Joseph** — State Hospital 2, St. Joseph, and Bi-Partisan Advisory Bd. State Building Comn., E. M. Eagan, executive secy., Jefferson City, plans by Eckel & Aldrich; St. Joseph, brick, concrete tuberculosis wards $80,000; plans by Walter Boschen St. Joseph, brick, concrete, kitchen building $110,000; plans by E. Meier and Everett, St. Joseph, brick, concrete psychiatric clinic, $240,000; plans by Henrici Lowry, 114 West 10th St., Kansas City, plumbing in old ward building $53,000•••plans by C. Sheppard, Kansas City, reconstructing cafeteria building, $67,000. P.W.A. project.

N. J., Glen Rock—Bd. Educ. will not build school. Project rejected at election. Est. $560,-000. Noted Oct. 24, C. D.—Oct. 31, E. N.-R.

★ **N. Y., New York**—New York State Marine Academy, 80 Centre St., plans constructing machine shop, technical building, etc., at Fort Schuyler. $1,750,000. Federal funds granted.

N. Y., New York—Dpt. Plant & Structures, Municipal Bldg., plans by A. F. Stokes, c/o owner, altering terminal South Street Ferry Building, for lodging house. Dpt. P. Welfare, Municipal Bldg., lessee.

N. Y., New York—Dpt. Hospitals, Municipal Bldg., rejected bids Sept. 25, constructing Children's Pavilion and installing elevator in City Hospital. Noted Sept. 26, C. D.—Sept. 19, E. N.-R.

★ **N. Y., Ogdensburg**—City, City Hall, plans by Randall & Vedder, S. A. & K. Bldg., Syracuse, and takes bids in spring, brick, steel school, plain found. $400,000. P.W.A. project.

N. Y., Perry—Village Bd. retained L. C. Reynolds, engr., Geneva, to prepare sketches constructing municipal light and power plant. $200,000.

N. Y., Poughkeepsie—Bd. Educ., A. C. Rust, pres., City Hall, plans high school. To exceed $105,000. Architect not appointed.

N. Y., St. Albans — W. Adelman, 107-48 118th St. Richmond Hill, plans by A. E. Allen, Garden City, group of dwellings, 115th Ave. and 115th Rd. $100,000 or more.

★ **N. Y. Syracuse**—Central New York Regional Market Authority, 525 Union Bldg., bids in February, composite piling for proposed regional market building, on Hiawatha Blvd. Bids on buildings in March. Total est. $800,000. P.W.A. project. C. W. Clark, 27 North Main St., Cortland, engr. and archt. Abbott & Merkt, Johns Manville Bldg., New York, engrs. Noted Dec. 17, C. D.—Dec. 26, E. N.-R., under "Contracts Awarded."

†N. Y., West Point—Con. Q. M., U. S. Military Academy, West Point, rejected bids Dec. 11, constructing Junior Officers Quarters, at U. S. Military Academy, $320,000. Will readvertise. Noted Dec. 19, C. D. — Nov. 28, E. N.-R.

N. Y., Yonkers—Bd. Educ., City Hall, plans constructing Senior and Junior High School, in 12th Ward. To exceed $105,000. Architect not appointed.

N. Y. Yonkers—Dpt. Military & Naval Affairs, Capitol Bldg., Albany, making plans constructing Naval Militia Academy, Alexander St. To exceed $100,000.

O., Ashland—City retained Barstow & Lefeber, engrs., 31 North Summit St., Akron, to make municipal light plant survey.

O., New Miami—Village, soon takes bids 2 story, basement, brick, concrete school, $197,-795. P.W.A. project. G. W. Barkman, Hamilton, archt. Noted Aug. 30, C. D.—Sept. 5, E. N.-R.

R. I., Burrillville—State, Emergency P. Wks. Comn., State House, Providence, rejected bids Dec. 10, constructing warehouse, garage, ice plant and incinerator at Wallum Lake Sanatorium. Will readvertise. P.W.A. project. Noted Dec. 18, C. D.—Oct. 17, E. N.-R.

R. I., Howard (Cranston)—State, P. Wks. Comn., State House, Providence, rejected bids Dec. 12, hospital building. P.W.A. project. E. O. Ekman, 72 Weybosset St., Providence, archt. Noted Dec. 19, C. D.

†Tex., Galveston—Treas. Dpt. at office Sup. Archt., Wash., D. C., soon takes bids constructing U. S. Coast Guard Station. $80,000.

Tex., Port Lavaca—Owners, c/o Calhoun Co. Engineering Dpt., making plans 2,000 bbl. capacity oil refinery plant to manufacture gasoline and oil by-products, $100,000; also making plans building 6 mi. 4 in. screw joint oil pipe main from new refinery to Port Lavaca Field. $80,000. Address County Engineer.

Tex., San Antonio—Bexar Co., c/o F. Woodhull, co. judge, soon takes bids rural school improvements. Est. $216,000. W. S. Goodman, c/o Court House, engr. W.P.A. project. Noted Sept. 11, C. D.—Sept. 19, E. N.-R.

Tex., San Antonio—Bd. Educ. c/o R. S. Menefee, pres., Matagorda and Lavaca Sts., plans by Phelps & De Wees, Gunter Bldg., new auditorium and repairing present old one at Brackenridge Public School on South Side. $164,000. Plans to be completed, bids received and contract awarded by Feb. 10.

★ **Tex., San Antonio**—Bd. Educ., c/o R. S. Menefee, pres., Matagorda and Lavaca Sts., plans by Phelps & De Wees, Gunter Bldg., improvement and development projects on San Antonio Schools. Est. total expenditure $626,-000. W.P.A. funds just approved by President Roosevelt.

★ **Tex., Wichita Falls**—City defeated $1,200,-000 bonds for municipal light and power project. Noted Dec. 2, C. D.—Dec. 5, E. N.-R.

★ **Utah, Ogden**—City and Weber Co., plans by Hodgson & McClenahan, Ogden, city and county building. $500,000. Noted June 23, 1933, C. D.—June 29, 1933, E. N.-R.

Wash., Walla Walla—School Dist. 1, Yakima, rejected bids Dec. 11, 1 story, 122x170 ft. school, school grounds. Noted Dec. 18, C. D.—Dec. 26, E. N.-R.

★ **Wis., Milwaukee**—Bd. School Directors plan five year program, incl. constructing Pulaski High School, $1,500,000; Riverside High School addition, $275,000; Windlake Ave. School, $400,000; School for Crippled Children, $200,-000; 36th Street School, $375,000; 68th St. School addition, $18,000; Washington High School addition, $40,000; Blaine School addition, $60,000; Boys Trade School, $25,000. Total $2,893,000. G. E. Wiley, c/o owner, archt.

★ **Wis., Milwaukee**—City, plans by X. Maltz, City Hall, constructing office building North Market St. Applied for $600,000 P.W.A. loan. R. E. Stoelting, comr.

Wis., Wauwatosa — Milwaukee Co. Institutions, rescinded awards of contracts for 1 story, 80x81 ft. boiler house at Children's Home. P.W.A. project. Will readvertise. J. Messmer, c/o owner, archt. Noted Dec. 26, C. D.

BIDS ASKED

†Conn., Thompsonville — Jan. 16 (extended date), by Treas. Dpt. at office Sup. Archt., Wash., D. C., constructing U. S. Post Office. Noted Dec. 17, C. D.—Dec. 26, E. N.-R.

†Fla., Pensacola—Jan. 15, by Yards & Docks, Navy Dpt., Wash., D. C., constructing quarters at Naval Air Station, Spec. 8083.

Ill., Elgin—Jan. 14, by C. H. Hammond, supervy. archt., Div. Architecture & Eng., Springfield, Dpt. P. Wks. & Buildings, plumbing, heating, electrical work and pipe covering and kitchen equipment work, tubercular patients building, and plumbing, heating, electric and pipe covering work, Infirmary Buildings 1 and 2, at Elgin State Hospital.

Ill., Jacksonville—Jan. 14, by C. H. Hammond, supervy. archt., c/o Dpt. P. Wks. & Buildings, Div. Architecture, Springfield, plumbing, heating, electrical work, pipe covering, assembly hall, for School for Deaf.

Ill., Quincy—Jan. 14, by C. H. Hammond, supervy. archt., Div. Architecture & Eng., c/o Dpt. P. Wks. & Buildings, Springfield, general contract infirmary building at Illinois Soldiers and Sailors Home.

Ill., Utica — Jan. 14, by C. H. Hammond, supervy. archt., Div. Architecture & Eng., c/o Dpt. P. Wks., Springfield, general contract log lodge and concession group, Starved Rock State Park.

Ind., Indianapolis—See "Contracts Awarded."

Ind., Mishawaka—Jan. 21, by Bd. School Trustees for Mary Phillips School, 2 story, basement, brick, steel, rein.-con. found. $200,-000. P.W.A. project. J. L. Hamilton, 814 Tower Court, Chicago, Ill., archt. Noted Oct. 14, C. D.—Oct. 17, E. N.-R.

†Mass., Rutland Heights—Feb. 4, by Veterans Administration, Arlington Bldg., Wash., D. C., constructing elevator and altering Building 12 at U. S. Veterans Hospital.

Minn., International Falls—Jan. 20, by Bd. Educ., C. J. Houska, clk., constructing 2 story, basement, 190x200 ft., brick, cut-stone, rein.-con. school. $265,000. N. W. Fisher, St. Mary's Bldg., St. Cloud, archt. Noted Dec. 2, C. D.—Dec. 5, E. N.-R.

Minn., Robbinsdale—Jan. 15, by Bd. Educ. E. R. Daniel, clk., 2 story, basement, brick, rein.-con. school. $180,000. P.W.A. project. Haxby & Bissell, 1111 Nicolett Ave., Minneapolis, archts. Noted Aug. 16, C. D.—Aug. 22, E. N.-R.

Mo., University City (St. Louis P. O.)—Jan. 15, by School Dist., c/o H. A. Frank, pres. Bd. Educ., 6701 Delmar Blvd., constructing 3 story, brick, concrete Junior High School building and addition to Jackson Park School, Jackson and Balsom Aves. P.W.A. project. W. B. Ittner, Inc., 408 Bd. Educ. Bldg., St. Louis, archts.

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†Federal Government.

Public Buildings (Continued)

†**N. H., Peterboro**—Jan. 13 (extended date), by Treas. Dpt. at office Sup. Archt., Wash., D. C., constructing U. S. Post Office. Noted Dec. 17, C. D.—Dec. 26, E. N.-R.

N. Y., Buffalo—Jan. 14, by A. H. Hopkins, archt., Liberty Bank Bldg., 3 story top addition to county office building, West Eagle St., for Erie Co., $175,000. P.W.A. project. Noted Dec. 18, C. D.—Dec. 26, E. N.-R.

N. Y., Falconer—Jan. 28, by Bd. Educ., Dist. 6, R. Turber, pres., constructing superstructures, North Side Grade School and High School addition, incl. heating, plumbing, electrical work. R. A. Freeburg, 1105 West 3rd St., Jamestown, archt. Noted Dec. 2, C. D.—Dec. 5, E. N.-R., under "Contracts Awarded."

N. Y., Hogansburg—Jan. 23, by Dpt. Educ., State Educ. Bldg., Albany, heating for St. Regis Indian School. P.W.A. project. Bids Dec. 3, rejected. Noted Nov. 26, C. D.

N. Y., Little Falls—Jan. 22, by Bd. Educ., Little Falls, automatic stokers and new heating systems, roof repairs, etc., for city schools. P.W.A. project. Bids Dec. 6 rejected. A. R. Acheson, Eckel Theatre Bldg., Syracuse, archt. Noted Dec. 17, C. D.—Dec. 26, E. N.-R.

★ **N. Y., Newburgh**—Jan. 15, by Bd. Educ., superstructure for Junior High School, $750,000. Starrett & Van Vleck, 267 5th Ave., New York, archts. Noted Dec. 19, C. D.—Dec. 26, E. N.-R., under "Contracts Awarded."

†**N. Y., Rome**—Jan. 23 (extended date), by Treas. Dpt. at office Sup. Archt., Wash., D. C., constructing U. S. Post Office. Noted Dec. 17, C. D.—Dec. 26, E. N.-R.

N. Y., Snyder—Jan. 16, by Bd. Educ., Amherst, general contract, heating, plumbing and electrical work for school, $278,408. P.W.A. project. P. H. Harbach & J. W. Kideney, 250 Delaware Ave., Buffalo, archts. Noted Nov. 19, C. D.—Nov. 21, E. N.-R., under "Contracts Awarded."

O., Chillicothe—Jan. 15, by School Bd., 1 story, basement, brick, concrete building and equipment for heating plant, plain found., for West 5th St. High School on 5th St. $27,500. P.W.A. project. Bids Dec. 11 rejected. Noted Dec. 2, C. D.—F. W. Garber and W. E. Bodenstein, both in Cincinnati.

†**Pa., Easton**—Jan. 28 (extended date), by Treas. Dpt. at office Sup. Archt., Wash., D. C., constructing U. S. Post Office. Noted Dec. 3, C. D.—Dec. 5, E. N.-R.

†**R. I., Wakefield**—Jan. 14 (extended date), Treas. Dpt. at office Sup. Archt., Wash., D. C., constructing U. S. Post Office. Noted Dec. 3, C. D.—Dec. 5, E. N.-R.

★ †**Tex., Fort Worth**—Feb. 11, by Treas. Dpt. at office Sup. Archt., Wash., D. C., constructing U. S. Narcotic Farm Buildings, $500,000.

★ **Tex., Houston**—Jan. 18, by City, c/o O. F. Holcombe, mayor, and Harris Co., c/o H. L. Washburn, aud., general contract 11 story, basement, 159x357 ft. outward and patient building, $970,000. A. C. Finn, Bankers Mortgage Bldg., Houston, archt.

†**Tex., Houston** — Jan. 20 (extended date), by Treas. Dpt. at office Sup. Archt., Wash., D. C., constructing U. S. Parcel Post Building (except elevator). $380,000. Noted Dec. 1, C. D.—Dec. 19, E. N.-R.

†**Utah, Sunset**—See "Contracts Awarded."

★ **Wash., Seattle**—Jan. 22, by Bd. Regents University of Washington, constructing 4 story, chemistry building, on campus, $1,089,000. Naramore, Grainger & Thomas, Arcade Bldg., archts. Noted Dec. 16, C. D.—Dec. 19, E. N.-R.

†**Wyo., Yellowstone Park**—Jan. 20 (extended date), by Treas. Dpt. at office Sup. Archt., Wash., D. C., constructing U. S. Post Office. Noted Nov. 18, C. D.—Nov. 21, E. N.-R.

CONTRACTS AWARDED

Calif., Alameda—City, Bd. Public Utilities, constructing 2 story and 1 story, rein.-con. substation and fire alarm buildings, to W. E. Lyons Constr. Co., 2009 Pacific Ave., $35,383 ***switchboard and regulator equipment and wiring, to Kenney Bros., 7 Front St., San Francisco, $96,287 and $56,343 respectively*** transformers, to Maloney Electric Co., Rialto Bldg., San Francisco, $24,504. Grand total $212,517. Bids Dec. 5, awarded Dec. 18. Noted Dec. 13, C. D.—Oct. 3, E. N.-R.

Calif., Chico—City Council, 1 story, rein.-con. gymnasium and 1 story, rein.-con. school, to Campbell Constr. Co., 800 R St., Sacramento, $92,641 and $81,165 respectively. P.W.A. Bids Dec. 16, awarded Dec. 23. Rejected bids Dec. 16, 1 story, concrete library, $30,000. Will readvertise. Noted Jan. 2, C. D.—Nov. 28, E. N.-R.

Calif., Long Beach—Long Beach Bd. Educ., 715 Locust Ave., Whittier Elementary School 2 story, steel to J. K. Thomas, 700 Kress Bldg., $109,498***plumbing, to O. E. Ross 1850 Pacific Ave., $5,874***heating, to Clarke Plumbing Co., 3304 East 7th St., $3,528*** electric wiring; to B. Hartman, 168 East Sunset Ave., $4,433. Grand total $123,333. Bids Dec. 13.

†**Calif., Madera**—Treas. Dpt. at office Sup. Archt., Wash., D. C., constructing U. S. Post Office, to F. J. Reilly, 6350 Fulton St., San Francisco, $121,800. Bids Oct. 24. Noted Oct. 28, C. D.—Oct. 3, E. N.-R.

†*Federal Government.*

†**Calif., North Hollywood** — Treas. Dpt. at office Sup. Archt., Wash., D. C., constructing U. S. Post Office, to V. O. Brunzell & A. Jacobson, 2100 Princeton Ave., Los Angeles, $72,789. Bids Nov. 20. Noted Nov. 26, C. D.—Oct. 24, E. N.-R.

†**Calif., Redding**—Treas. Dpt. at office Sup. Archt., Wash., D. C., constructing U. S. Post Office, to Dinwiddie Constr. Co., Crocker Bldg., San Francisco, $83,000. Bids Nov. 27. Noted Dec. 20, C. D.

Calif, Sacramento—State Dpt. P. Wks. Div. Architecture, P. Wks. Bldg., pile foundations for two 4 story, rein.-con. office buildings to house State Dpt. P. Wks. and State Motor Vehicle Departments, South N St. between 11th and 12th Sts., to Raymond Concrete Pile Co., 333 Montgomery St., San Francisco, $71,578. Bids Dec. 24, awarded Dec. 30. Noted Dec. 13, C. D.

Calif., Salinas—Trustees Salinas City School Dist., general contract 10 classroom school, to F. J. Reilly, 6350 Fulton St., San Francisco, $92,331***structural changes in domestic science building, to H. C. Geyer, 946 Hallam St., Monterey, $29,595. Bids Dec. 12, awarded Dec. 17, E. N.-R. Noted Dec. 23, C. D.

Calif., Salinas—Treas. Dpt. at office Sup. Archt., Wash., D. C., constructing U. S. Post Office, to F. J. Reilly, 6350 Fulton St., San Francisco, $92,841. Bids Nov. 22. Noted Nov. 27, C. D.—Oct. 31, E. N.-R.

Calif., San Francisco—City and San Francisco Co., 3 story, rein.-con. administration building, Bush and Stockton Sts., for San Francisco Oakland Bay Bridge Exposition, to Lindgren-Swinerton, 225 Bush St., $140,781 with alternates. Awarded Dec. 30. Noted Dec. 27, C. D.

†**Calif., San Rafael**—Treas. Dpt. at office Sup. Archt., Wash., D. C., constructing U. S. Post Office, to L. Epp, 4745 Geary St., San Francisco, $58,750. Bids Nov. 1. Noted Nov. 12, C. D.

Calif., Stockton—O. H. Chain, general contractor, 41 South Sutter St., electrical work for cotton compress, to C. J. Franke Co., 748 East Weber Ave., for City Port District. Noted Dec. 18, C.D.—Dec. 26, E.N.-R., under "Contracts Awarded."

†**Calif., Ventura**—Treas. Dpt. at office Sup. Archt., Wash., D. C., constructing U. S. Post Office, to Wesco Constr. Co., 2000 Hyperion Ave., Los Angeles, $93,850. Bids Sept. 16. Noted Sept. 26, C. D.—Sept. 12, E. N.-R.

Calif., Wilmington—Los Angeles Bd. Educ., Chamber of Commerce Bldg., reconstructing, rehabilitating, strengthening auditorium building at Gulf Ave. School, involving installation of bracing, rein.-con. and structural steel, metal lath and plastering, painting, electrical work, etc., to Contracting Engineers, 2310½ West Vernon Ave., Los Angeles, $14,231. P.W.A. Bids Nov. 12, awarded Dec. 16. H. L. Gogerty, 6272 Yucca St., Los Angeles, archt. R. McC. Beanfield, Chamber of Commerce Bldg., Los Angeles, engr.

†**Colo., Lamar** — Treas. Dpt. at office Sup. Archt., Wash., D. C., constructing U. S. Post Office, to Busboom & Rauh, Salina, Kan., $59,100. Bids Nov. 22. Noted Nov. 27, C. D.—Oct. 31, E. N.-R.

Colo., Pueblo—Colorado State Hospital, office of the Steward, general contract three 3 story, rein.-con., brick dormitory buildings, etc., to Thomas Bate, Denver, $224,397***plumbing, to Park Hill Plumbing & Heating Co., Pueblo, $14,296***heating, to Denver Plumbing & Heating Co., Denver, $17,700. Grand total $256,393. P.W.A. Noted Nov. 20, C. D.

Colo., Wheatridge—Secretary School Bd., general contract 2 story, basement, 142x171 ft., brick, rein.-con. school, to H. W. Hammond, 4043 West 29th Ave., Denver, $119,406*** plumbing, to Midwest Plumbing & Heating Co., 2450 Blake St., Denver, $5,092***heating, to Johnson-Davis Plumbing & Heating Co., 2239 Arapohoe St., Denver, $18,587. Grand total $143,085. Est. $127,000. P.W.A. Bids Dec. 2. Noted Nov. 25, C. D.

†**Conn., Bristol** — Treas. Dpt. at office Sup. Archt., Wash., D. C., extending U. S. Post Office, to Tremaglio Bros., Waterbury, $119,900.

†**D. C., Wash.**—Treas. Dpt. at office Sup. Archt., Wash., D. C., constructing exhibition building for pachyderms, to Harwood-Nebel Constr. Co., 2539 Pennsylvania Ave., $280,600. Bids Dec. 2. Noted Dec. 5, C. D.—Nov. 14, E. N.-R.

†**D. C., Wash.** — Treas. Dpt. at office Sup. Archt., Wash., D. C., constructing machine and carpenter shop, at National Zoological Park, to Bahen & Wright, 916 Rhode Island Ave., N. E., $129,900. Bids Nov. 26. Noted Dec. 2, C. D.—Oct. 31, E. N.-R.

†**D. C., Wash.**—Treas. Dpt. at office Sup. Archt., Wash., D. C., constructing exhibition building for small mammals and great apes, at National Zoological Park, to G. Hyman Constr. Co., 7th and T Sts. N. E., $257,000. Bids Dec. 2. Noted Dec. 5 C. D.—Nov. 14, E. N.-R.

†**D. C., Wash.** — Treas. Dpt. at office Sup. Archt., Wash., D. C., constructing bird house completion, C. H. Tompkins, 1630 Conn. Ave. N. W., $103,470. Bids Nov. 19. Noted Nov. 25 C. D.—Oct. 31, E. N.-R.

†**D. C., Wash.**—McCloskey & Co., general contractors, 1620 West Thompson St., Phila., Pa., 570 tons reinforcing steel for archives building, to American Steel Eng. Co., 3520 Indian Queen Lane, Phila., Pa., for Treas. Dpt. at office Sup. Archt., Wash., D. C. Noted Dec. 17, C. D.—Dec. 26, E. N.-R., under "Contracts Awarded."

†**Ill., Chicago** — Treas. Dpt. at office Sup. Archt., Wash., D. C., constructing Morgan Park Station to M. L. Bein, 134 North LaSalle St., $91,490. Noted Nov. 27.

†**Ill., Chicago**—Treas. Dpt. at office Sup. Archt., Wash., D. C., constructing Stock Yards Postal Station, to Henke Constr. Co., 609 North Wells St., $224,745. Bids Dec. 4. Noted Dec. 10, C. D.

Ill., East Moline—Dpt. P. Wks. & Buildings, Div. Architecture, Springfield, general contract E-Type Ward Building at state hospital, to J. H. Hunzinger & Co., Davenport, Ia., $179,827 ***pipe covering, to Standard Asbestos Mfg. Co., 822 West Lake St., Chicago, $4,550*** electric wiring, to Wakeford Electric Co., 205 West Wacker Dr., Chicago, $7,654***heating, to Gallaher & Speck, 346 West Harrison St., Chicago, $17,920***plumbing, to H. P. Reger & Co., 1501 East 72nd Pl., Chicago, $20,900. Grand total $229,941. P.W.A.

Ill., Elgin—Dpt. P. Wks. & Buildings, Div. Architecture, Springfield, general contract tuberculosis building, to James McHugh Sons, 6449 South Park Ave., Chicago, $89,890***ward building, to C. E. Giertz & Son, 360 Crystal St., Elgin, $85,600***elevator, to Westinghouse Elevator Co., 1500 North North Branch St., Chicago, $6,199. Grand total $118,689. P.W.A.

Ill., Jacksonville—Dpt. P. Wks. & Buildings, Div. Architecture, Springfield, general contract assembly hall and cottage for boys at Illinois School for Deaf, to James McHugh Sons, 6449 South Park Ave., Chicago, $109,985 and $53,450 respectively. P.W.A.

Ill., Kankakee—Dpt. P. Wks. & Buildings, Div. Architecture, Springfield, general contract infirmary building, to J. L. Simmons Co., Bloomington, $106,700***diagnostic building, to J. Noroff & Son, Kankakee, $279,300*** elevator equipment, diagnostic building, to Westinghouse Electric Elevator Co., 1500 North North Branch St., Chicago, $6,499. Grand total $392,499. P.W.A.

Ill., Manteno—Dpt. P. Wks. & Buildings, Div. Architecture, Springfield, general contract 7 dormitory buildings and chief engineer's residence, at Manteno State Hospital, to J. Felmley Co., Bloomington, $86,400***electric wiring, to Reily & Reily, Kankakee, $10,199***heating, to M. H. J. Corby Co., 406 North Des Plaines Ave., Chicago, $14,964***plumbing, to J. J. Calnan & Co., 440 South Dearborn St., Chicago, $17,720 ***electrical work, for 2 dormitory buildings and for tubercular patients building, to Hub Electric Co., 2219 West Grand Ave., Chicago, $10,000 and $9,963 respectively. Grand total $149,246. P.W.A. Bids Nov. 18. Noted Nov. 26, C. D.—Nov. 14, E. N.-R.

†**Ill., St. Charles**—Treas. Dpt. at office Sup. Archt., Wash., D. C., constructing U. S. Post Office, to C. A. Moses Constr. Co., 176 West Adams St., Chicago, $56,472. Bids Nov. 22. Noted Nov. 27, C. D.—Oct. 31, E. N.-R.

Ind., Indianapolis—State Bd. Agriculture, State House, 1 story, 80x400 ft. horse barn, at State Fair Grounds, by relief labor, W. P. A. project, $200,000. Burns & James, 906 Architects Bldg., archts. Owner will take bids on brick, hollow tile, rein.-con., structural steel, steel sash.

Ind., Terre Haute—Bd. P. Wks., City Hall general contract 2 story, basement city hall, to William P. Jungclaus Co., 825 Massachusetts Ave., Indianapolis, $221,354. Bids Dec. 12. Noted Dec. 19, C. D.—Oct. 10, E. N.-R.

Ia., Manilla—Independent School Dist., excavating for school addition, to Olson Constr. Co., Harlan. P.W.A. Bids Dec. 14, awarded Dec. 14.

Ia., Sac City — Independent School Dist., general contract Junior and Senior High School, to T. Park, Storm Lake, $97,960***plumbing and heating, to V. J. Hagan, Sioux City, $16,693***electrical work, to Wack Electric Co., Council Bluffs, $3,319. Grand total $117,972. P.W.A. Bids Dec. 10. Noted Dec. 2, C. D.—Dec. 5, E. N.-R.

Ky., Ft. Mitchell—Bd. Educ. Kenton Co., Covington, constructing school, to Penker Constr. Co., 1030 Summer St., Cincinnati, O. Est. $225,000. Noted Oct. 25, C. D.—Oct. 31, E. N.-R.

La., New Orleans—Orleans Parish School Bd., 3 story, rein.-con., brick school, to O. M. Gwinn Constr. Co., 3501 Fern St., $229,938*** plumbing, heating and ventilating, to Sciambra & Maseno, Inc., 636 North Broad St., $36,290 ***electrical work, to Thos. V. Sharp, 239 Chartres St., $21,200. Grand total $287,427. Noted Dec. 19, C. D.

†**Me., Farmington**—W. MacDonald Constr. Co., general contractors, 3829 West Pine Blvd., St. Louis, heating and plumbing for post office, for Treas. Dpt. at office Sup. Archt., Wash., D. C., to W. D. Durnhall, Inc., Lakeland, Fla.*** waterproofing, dampproofing and insulation, to Hahnel Bros. Co., 42 Main St., Lewistown*** plastering, to Williamsport Plastering Co., Box 734, Williamsport***reinforcing steel, to Concrete Eng. Co., Louderman Bldg., St. Louis*** structural steel, to F. P. Lyons Iron Wks., 500 Willow St., Manchester***miscellaneous iron, to Hansell Elcock Co., South Archer and South Normal Aves., Chicago, Ill.***roofing, to Hehnel Bros. Co., 42 Main St., Lewiston. Bids Sept. 25. Noted Oct. 29, C. D.—Oct. 31, E. N.-R.

†**Md., Chesterton**—Treas. Dpt. at office Sup. Archt., Wash., D. C., constructing U. S. Post Office, to H. J. Geyer, 1009 Beechfield Ave., Baltimore, $65,138. Bids Nov. 27. Noted Dec. 2, C. D.—Oct. 31, E. N.-R.

Md., Westminster — Carroll Co. Bd. Educ., Court House, 2 story, basement high school

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Public Buildings (Continued)

building, to A. F. Feeser, Taneytown, $163,219. P.W.A. Noted Dec. 9, C. D.

†**Mass., Eastham**—F. A. Days & Sons, general contractors, 24 Pearl St., Provincetown, Mass., electrical work for station dwelling at U. S. Coast Guard for Coast Guard, to Murray & Gates, Wellfleet***painting, to F. S. Burt, Provincetown***plastering, to E. A. Nickerson, Chatham. Noted Dec. 19, C. D.—Dec. 26, E. N.-R., under "Contracts Awarded."

Mass., Boston—City, R. O. Hall, supt. P. Buildings, 1005 City Hall Annex, altering and constructing addition to Quincy Market, Market St. to Daniel Cunningham Constr. Co., Statler Bldg., Boston, $392,400. P.W.A. Bids Dec. 6, awarded Dec. 12. Noted Dec. 18, C. D.

Mass., Boston—City, Dpt. School Buildings, W. W. Drummey, supt. of construction, 11 Beacon St., for Intermediate School, 3 story, basement, 200x257 ft., Dudley St., Roxbury, to Thomas O'Connor & Co., 238 Main St., Cambridge, $547,800. P.W.A. Bids Dec. 13, awarded Dec. 17. Noted Dec. 19, C. D.

Mass., Framingham—Steed-Barber Corp., general contractors, 7 Water St., Boston, structural steel for construction of May Hall E-101, at State Teachers College, for Commonwealth of Massachusetts, Dpt. Educ., State House, Boston, to Haarmann Steel Co., Ducharme Ext., West Holyoke***ornamental and miscellaneous iron and bronze, to American Archt. Iron Works, 111 Liverpool St., East Boston***painting, to R. E. McCassey Co., 54 Playstead Rd., Newton***reinforcing steel, to Barker Steel Co., 238 Main St., Cambridge***cast stone, to Eastern Cement Stone Co., 6 Lynn St., Malden. Noted Dec. 20, C. D.—Dec. 26, E. N.-R., under "Contracts Awarded."

Mass., Natick — Chandler Constr. Co., Inc., general contractors, 45 Newbury St., Boston, ornamental and miscellaneous iron and bronze for ammunition magazine with barriers, A. Spera St., for Commonwealth of Massachusetts, W. I. Rose, chn. Armory Comn., State House, Boston, to American Archt. Iron Co., 111 Liverpool St., East Boston***painting, to L. Nuissl, 11 Cottage Ave., West Roxbury***plumbing, to James H. Unsworth Co., 290 Trapelo Rd., Belmont***electrical work, to Friedman Electric Co., 137 Pearl St., Boston***road to grade, to Randall & Dinley Constr. Co., Main St., Sherborn. Noted Dec. 4, C. D.—Oct. 17, E. N.-R.

Mass., Newburyport—George A. Fuller Co., general contractors, 11 Beacon St, Boston, heating and plumbing for high school, High St. and Toppans Lane, for City, to T. J. Murphy & Co., 8 Walden St., Cambridge***electrical work, to Lord Electric Co., 303 Columbus Ave., Boston ***structural steel, to Pittsburgh Bridge & Iron Wks., Fulton Bldg., Pittsburgh, Pa.***granite, to John Harrington Co., 52 First St., Cambridge ***marble and tile, to Galassi Mosaic & Tile Co., 11 Bennett St., Boston***painting, to F. W. Garrett, 19 Ferry Rd., Newburyport. Noted Dec. 13, C. D.—Nov. 28, E. N.-R.

Mass., Southbridge—F. X. Laliberte & Son, Inc., general contractors, 59 Beecher St., Southbridge, cast stone for 2 story, basement, 70x145 ft., school Eastford St., and 1 story, 2 floors, 65x190 ft. school, West St., for Town, School Dpt., E. A. Schumacher, chn. Building Comn., to Emerson & Norris, 163 North Beacon St., Brighton***structural steel and iron, to Stafford Iron Wks., Inc., 135 Stafford St., Worcester***light iron, to E. Van Noorden Co., 100 Magazine St., Roxbury***painting, to Priscilla Paint & Roofing Shoppe, Inc., 266 Main St., Southbridge***heating, plumbing, ventilating, and heat control, to G. C. Winter Co., 344 Main St***electrical work and sound, to Alfred C. General Electric Co., Westboro. Noted Dec. 17, C. D.—Dec. 26, E. N.-R., under "Contracts Awarded."

Mass., Swampscott — Town, School Building Comn., brick, steel high school addition, to M. Spinelli & Sons, 38 Chauncy St., Boston, Mass., $338,000. P.W.A. Bids Nov. 22. Noted Dec. 2, C. D.—Oct. 31, E. N.-R.

Mass., Taunton—Underground Steam Constr. Co., general contractors, 75 Pitts St., Boston, sublet contract for structural steel for boilers at state hospital, for Commonwealth of Massachusetts, Dpt. Mental Diseases, State House, Boston, to C. T. Alger, 40 West Britainned St. ***painting, to H. Newton Marshall Co., 522 Harrison Ave., Boston***electrical work, to Lord Electric Co., 303 Columbus Ave., Boston*** boilers, to Starkweather Eng. Co., Inc., 79 Milk St., Boston***fires, to James Russell Boiler Wks. Co., Dewar St., Dorchester***boiler settings, to Oscar F. Carlson Co., Island Pond Rd., Springfield***combustion control, to Haran Corp., Bowman Bldg., Pittsburgh, Pa.***insulation, to Philips Carey Co., 121 Beverly St., Boston. P.W.A. Noted Dec. 27, C. D.—Jan. 2, E. N.-R., under "Contracts Awarded."

†**Mass., Wakefield**—Treas. Dpt. at office Sup. Archt., Wash., D. C., constructing U. S. Post Office, to Long Constr. Co., 185 Devonshire St., Boston, $80,375. Bids Nov. 29. Noted Dec. 3, C. D.

Mass., Waltham — Commonwealth of Massachusetts, Dpt. Mental Diseases, State House, Boston, furnishing electric fixtures for wings of medical and surgical building at Metropolitan State Hospital, to E. C. Lewis, Inc., 121 Federal St., Boston, $1,360. P.W.A. Bids Oct. 28, awarded Dec. 19. Noted Oct. 14, C. D.—Oct. 17, E. N.-R.

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Mass., Watertown—Town, School Com., Administration Bldg., Main St., 2 story, basement, 80x132 ft., brick, steel, cast stone, granite elementary school, concrete found., to M. S. Kelliher Co., 38 Chauncy St., Boston, $159,365. P.W.A. Bids Nov. 29, awarded Dec. 13.

★ **Mass., Westfield**—Commonwealth of Massachusetts, Dpt. P. Health, State House, Boston, (1) 2 story basement, 40x154 ft. and 42x188 ft., Job "A," hospital building (2) 3 story, basement, 22x157 ft. and two 55x78 ft. wings, Job "C," nurses home (3) 1 story, basement, 42x99 ft. Job "B," storehouse, all foregoing at State Sanatorium, (A), general contract, (B) heating, (C) plumbing (D) electrical work, (E) structural steel, (F) ornamental and miscellaneous iron and bronze work, (G) painting, (H) reinforcing steel, (I) elevators, to D. A. Sullivan & Sons, Inc., 78 Main St., Northampton, (1A) $376,467***to W. K. Traquair 596 South St., Holyoke (2A) $146,091***to E. J. Pinney Co., Inc., 220 Dwight St., Springfield (3A) $25,753***to Fred C. McClean, Inc., 47 Park St., Springfield (1B) $31,133 (3B) $2,031***to Wm. H. Mitchell & Son Co., 90 Arch St., Boston (1C) $26,950 (2C) $12,300, (3C) $1,770***to Jas. Wilkinson & Co., 128 Oliver St., Boston (1D) $24,900, (2D) $6,014, (3D) $935***to. Holyoke Supply Co., 210 Rose St., Holyoke (2B) $11,180. Grand total $665,524. Bids Dec. 10, awarded Dec. 17 and 27. D. A. Sullivan & Sons, Inc., 78 Main St., Northampton, general contractor hospital building, awarded subcontracts, to Haarmann Steel Co., Ducharme Ext., West Holyoke***(1F) to Quincy Ornamental Iron Wks., 161 A St., South Boston***(1G) to H. Newton Marshall Co., 522 Harrison Ave., Boston***(1H) to Truscon Steel Co., 38 Chauncy St., Boston***(1I) to Otis Elevator Co., 130 Clarendon St., Boston, W. K. Traquair, 596 South St., Holyoke, general contractor for nurses home, awarded subcontracts (2H) to Truscon Steel Co., 38 Chauncy St., Boston*** (2E) and (2F) to Haarmann Steel Co., Ducharme Ext., West Holyoke***(2G) to H. Newton Marshall Co., 522 Harrison Ave., Boston, E. J. Pinney Co., Inc., 220 Dwight St., Springfield, general contractor for storehouse awarded subcontracts (3E) to Steel Fran. Co., Melton, Pa.***(3G) to A. W. Anderson Co., 66 West Dedham St., Boston***(3F) to Haarmann Steel Co., Ducharme St., Ext. West Holyoke. Noted Dec. 26, C. D.—Oct. 17, E. N.-R.

Mass., Worcester—Major E. Tucker, supt. City Hospital, hardware contract in connection with construction of ward and surgical building, at City Hospital to Waite Hardware Co., 189 Front St., $5,699***plumbing fixtures, to R. C. Sullivan Co., 265 Sixth St., Cambridge, $16,344***sprinkler system, to Viking Automatic Sprinkler Co., 430 Statler Bldg., Boston, $3,164 ***smoke breeching, to Stewart Boiler Wks., Albany St., $1,600. Grand total $26,807. P.W.A. Noted Jan. 2, C. D.

Mass., Worcester—City, at office of Mayor, City Hall, elevators only in ward and surgical building at City Hospital, to Otis Elevator Co., 130 Clarendon St., Boston, about $35,800. P.W.A. Bids Nov. 5, awarded Dec. 19. Noted Oct. 28, C. D.—Oct. 31, E. N.-R.

Mich., Ann Arbor—Bd. Educ., general contract Junior High School, brick, steel, stone, rein.-con., plain found., to Henry J. Hoehrein & Son, Ann Arbor, $244,006. P.W.A. Bids Dec. 19. Noted Dec. 20, C. D.—Dec. 5, E. N.-R.

Mich., Dearborn—G. T. Martin, general contractor, brick, steel, stone, rein-con. school for Bd. Educ., to Patterson Eng. Co., 8044 Wheeler Ave., Detroit, $128,980***electrical work, to Hamil Electric Co., 209 Curtis Bldg., Detroit, $10,874***heating and plumbing, to Travis Bros., 2631 Barley Ave., Detroit, $26,156. Grand total $166,010. P.W.A. Bids Dec. 21. Noted Dec. 20, E. N.-R.

★ **Mich., Detroit**—C. A. Gadd, bus. mgr. Bd. Educ., general contract brick, steel, rein.-con. school, to Rozyski Bros., 1950 East Canfield St., $696,850; heating and plumbing, to Drake Avery Co., 147 West Woodbridge St., $189,998. P.W.A. Bids Nov. 15, awarded Nov. 7, C. D.—May 9, E. N.-R.

Mich., Grosse Pointe—R. M. Clark, secy., 2 story, brick, steel, stone, rein.-con. school, plain found., to A. W. Kutsche, 2111 Woodward Ave., Detroit, $253,800. P.W.A. Bids Nov. 25. Noted Nov. 8, C. D.—Nov. 14, E. N.-R.

Mich., Traverse City—Bd. Educ., general contract 2 story, basement, brick, steel, stone, rein.-con. school building, to Strom Constr. Co., Grand Rapids, $246,395***electrical work, to Hall Electric Co., Muskegon, $9,895***plumbing and heating, to Phoenix Sprinkling & Heating Co., Grand Rapids, $40,100. Grand total $296,290. Noted Nov. 22, C. D. — Nov. 28, E. N.-R.

Miss., Gulfport—Bd. Trustees Gulfport High School, general contract 1 and 2 story school buildings, to Dye & Mullins, Columbia, $121,480***plumbing and heating, to Horne Plumbing Co., Gulfport, $28,300***roofing and sheet metal work, to Coast Roofing & Sheet Metal Co., Gulfport, $5,775. Grand total $155,555. Bids Dec. 11, awarded Dec. 12. Rejected bids Dec. 11, on wiring. Will readvertise. Noted Dec. 9, C. D.

Miss., Leland — Leland Consolidated School Dist., general contract 1 story, 198x219 ft., brick, steel, stone school, incl. cafeteria and auditorium, 90x100 ft. gymnasium, also 4 room, brick teachers' residence, to M. T. Reed Constr. Co., Belzoni, $97,984***plumbing for school and gymnasium and heating for school, to Fischer Heating & Plumbing Co., Memphis, Tenn., $10,581***gas heating for gymnasium building, to American Plumbing & Heating Co., New Orleans, La., $1,157***electrical work, to Stuart C. Irby Co., Jackson, Miss., $4,155. Grand total $113,877. P.W.A.

†**Minn., Northfield**—Treas. Dpt. at office Sup. Archt., Wash., D. C., constructing U. S. Post Office, to James Leck Co., 211 South 11th St., Minneapolis, $86,336. Bids Aug. 14. Noted Aug. 19, C. D.—July 18, E. N.-R.

Minn., Willmar—State Bd. Control, State Office Bldg., furnishing, installing boilers, stoker-boiler foundations and settings, breeching, etc., at State Asylum, to Commonwealth Electric Co., 417 Bway., St. Paul, $44,146. P.W.A. Bids Dec. 3. Noted Nov. 13, C. D.—Nov. 21.

Mont., Harve—School Dist. 16, Hill Co., H. Meiseger, clk., plumbing and heating for 2 story, 60x100 ft. school, to Elmer Johnson, Glasgow, $9,548. Bids Dec. 10. Noted Jan. 2, C. D.—Jan. 9, E. N.-R., under "Contracts Awarded."

Neb., Minden—City, general contract high school, to W. Knutzen & Son, Kearney, $90,467 ***electrical work, to Electric Shop, Minden, $5,394***heating and plumbing, to Minden Sanitary Plumbing Co., Minden, $13,050. Grand total $114,911. P.W.A. Bids Nov. 29. Noted Nov. 25, C. D.

†**Neb., Seward**—Treas. Dpt. at office Sup. Archt., Wash., D. C., constructing U. S. Post Office, to E. Rokahr & Sons, Lincoln, $46,983. Bids Nov. 29. Noted Dec. 3, C. D.—Oct. 31, E. N.-R.

Neb., O'Neill—Holt Co., excavation for court house, to Grand Island Supply Co., Grand Island, $21,043. P.W.A. Bids Dec. 5. Noted Oct. 2, C. D.—Oct. 10, E. N.-R.

N. H., Concord — State, E. H. Hunter, chn. engr. P. Wks. Division, State House, 3 story, basement, 80x137 ft., brick, steel, stone addition to Tobey Building, to Swanburg Constr. Co., 61 Amherst St., Manchester, $168,487***heating and plumbing, to J. H. Stevens, 46 Manchester St., Manchester***electrical work, to Reliable Wiring Co., 34 Warren St. P.W.A. Noted Dec. 19, C. D.—Feb. 29, E. N.-R.

N. H., Greenville — L. H. Shattuck, Inc., general contractors, 208 Granite St., Manchester, structural steel and iron in connection with construction of town hall, for Town, Town House Building Com., Main St., to Lyons Iron Wks., Inc., 500 Willow St., Manchester*** granite, to Rossi Bros. Co., Oak St., Milford*** roofing, to Manchester Roofing Co., rear 195 Elm St., Manchester***painting, to Joel S. Daniels, 356 Pine St., Manchester. Noted Dec. 19, C. D.—Dec. 26, E. N.-R.

N. H., Nashua—City, A. L. Cyr, clk., City Hall, foundation for Senior High School, Elm St., to W. H. Trumbull, 11 Lebanon St., Hanover, $31,000. P.W.A. Bids Dec. 11, awarded Dec. 13. Noted Dec. 18, C.D.

†**N. J., Atlantic City**—John McShain, general contractor, 1610 North St., Phila., Pa., 575 tons reinforcing steel for housing development, to Concrete Steel Co., 2 Park Ave., New York, for P. Wks. Administration, Wash., D. C. Noted Dec. 23, C. D.—Dec. 26, E. N.-R., under "Contracts Awarded."

N. J., Belleville—Bd. Educ., 183 Union Ave., general contract constructing school in Essex Co., to O. A. Peterson Constr. Co., 78 North Willow Ave., Montclair, $121,668***structural steel, to Breen Iron Wks., 272 Badger St., Newark, $22,025***plumbing, to Jachnig & Peoples, 223 13th St., Newark, $8,002***electrical work, to P. H. Jachnig, Inc., 106 Academy St., Newark, $14,570***heating and ventilating, to A. Arace & Son, 642 3rd Ave., Elizabeth, $27,962. Grand total $194,227. P.W.A. Noted Nov. 26, C. D.—Dec. 5, E. N.-R.

★ **N. J., Paterson**—Bd. Educ., City Hall, general contract constructing new school, to E. M. Waldron, Inc., 40 Park Pl., Newark, $380,520***electrical work, to Beach Electric Co., 510 Broad St., Newark, $33,884***heating and ventilating, to F. A. McBride, 325 Grand St., $56,558***plumbing, to Jachnig & Peoples, Inc., 223 13th Ave., Newark, $20,870***steel, to Lehigh Structural Steel Co., Allentown, $38,975. Grand total $530,807. P.W.A. Noted Dec. 11, C. D.—Dec. 19, E. N.-R.

N. J., Point Pleasant—Bd. Educ., addition to high school, to Pozzi & Felice, 1876 South Broad St., Trenton***plumbing, heating and ventilating, to Richardson Eng. Co., New Brunswick***electrical work, to Brown Electric Co., 10 New Jersey Ave., Trenton. P.W.A. Noted Dec. 19, C. D.—Dec. 26, E. N.-R.

†**N. J., Rahway**—Treas. Dpt. at office Sup. Archt., Wash., D. C., constructing U. S. Post Office, to Reliable Constr. & Eng. Co., Grantwood, $93,500. Bids Nov. 25. Noted Dec. 9, C. D.—Oct. 31, E. N.-R.

N. J., Teaneck—State, State House, Quartermaster General, borings for new armory, to P. J. Healey, Inc., 207 Baldwin Ave., Jersey City, $1.45 per lin.ft. of earth boring, and $2.45 per lin.ft. core boring. Noted Oct. 11, C. D.—Oct. 17, E. N.-R.

N. Y., Altona—Central School Dist. 1, foundations for school, to M. E. Ryan Co., 1545 Union St., Schenectady. Total est. $216,363. P.W.A. Bids on superstructure later. A. W. Inman, 71 Clinton St., Plattsburg, archt.

N. Y., Angola — Bd. Educ., plumbing for school, to C. C. Grimm, 259 Delaware Ave.

†*Federal Government.*

Public Buildings (Continued)

Buffalo, $7,200***heating, to J. Davis, 70 West Chippewa St., Buffalo, $11,997***electrical work, to Ferguson Electric Constr. Co. 204 Oak St., Buffalo, $6,150. Grand total $25,347. **P.W.A.** Bids Dec. 5. Noted Dec. 17, C. D.—Dec. 26, E. N.-R., under "Contracts Awarded."

†**N. Y., Beacon** — Treas. Dpt. at office Sup. Archt., Wash., D. C., constructing U. S. Post Office, to Summit Constr. Co., 3 Beechwood Rd., Summit, N. J., $67,000. Bids Nov. 8. Noted Nov. 15, C. D.—Oct. 10, E. N.-R.

N. Y., Brooklyn—Dpt. Parks, Arsenal Bldg., Central Park, New York, removal of present roofing and skylights, etc., Wing D, and replacing Central Museum Building of Brooklyn Institute of Arts and Sciences, Eastern Parkway, to Cooperative Sheet Metal Wks., 4476 3rd Ave., $16,000. Bids Dec. 16. Noted Dec. 13, C. D.—Dec. 19, E. N.-R.

†**N. Y., Canton**—Treas. Dpt. at office Sup. Archt., Wash., D. C., constructing U. S. Post Office, to Nicolette Constr. Co., Potsdam, $49,625. General contractor will soon award contracts for plumbing, heating, electrical work. Bids Dec. 13. Noted Dec. 18, C. D.—Dec. 5, E. N.-R.

N. Y., Chester—Village, school, Maple Ave., to G. Stanley Irish Contg. Co., 102 Benedict St., Syracuse***plumbing, to Fox Plumbing Co., 103 Park Ave., New York***heating and ventilating, to Johnson Heating Co., 306 East 26th St., New York***electrical work, to A. J. Strong, 91 Murray Ave., Goshen. Total est. $216,996. **P.W.A.** Noted Aug. 30, C. D.—Sept. 5, E. N.-R.

†**N. Y., Floral Park**—Treas. Dpt. at office Sup. Archt., Wash., D. C., constructing U. S. Post Office, to W. A. Berbusse, 101 Park Ave., New York, $62,830. Bids Nov. 25. Noted Dec. 2, C. D.—Oct. 31, E. N.-R.

†**N. Y., Garden City** — Treas. Dpt. at office Sup. Archt., Wash., D. C., constructing U. S. Post Office, to Gotham Constr. Co., 103 Park Ave., New York, $86,700. Bids Nov. 22. Noted Nov. 27, C. D.—Oct. 31, E. N.-R.

N. Y., Gouverneur—Union Free School Dist. 1, foundations for school, to Wright & Hodge, 61 Burchard St., Watertown. **P.W.A.** Total est. $223,986. Bids soon on superstructure. Bond issue approved. Noted Nov. 7, C. D.

N. Y., Hudson—Bd. Educ., heating for school, to Cohn & Kramer, 48 Grand St., Albany, $47,000***plumbing, to Hauxwell Smith, 46 Broad St., Port Chester, $22,000***electrical work, to E. G. May, 51 Central Ave., Albany, $26,723. Grand total $95,723. **P.W.A.** J. H. Eisele Co., Inc., general contractors, 18 East 41st St., New York, 175 tons structural steel for same, to Belmont Iron Wks., 44 Whitehall St., New York. Noted Dec. 11, C. D.—Dec. 19, E. N.-R.

N. Y., Ithaca—Bd. Educ., Ithaca, plumbing for school, to Donohue & Halverson, Inc., North Aurora St., Ithaca***heating and ventilating, to American Warming & Ventilating Co., 317 Penna. Ave., Elmira***electrical work, to Doster & Egan, 204 Erie Blvd., East Syracuse. **P.W.A.** Noted Dec. 17, C. D.—Dec. 26, E. N.-R., under "Contracts Awarded."

N. Y., Keeseville — Central School Dist. 1, foundations for school, to M. E. Ryan, 1545 Union St., Schenectady. **P.W.A.** Total est. $280,000. A. W. Inman, 71 Clinton St., Plattsburg, archt. Bids on superstructure later. Noted Dec. 11, C. D.—Oct. 31, E. N.-R.

†**N. Y., LeRoy** — Treas. Dpt. at office Sup. Archt., Wash., D. C., constructing U. S. Post Office, to W. F. Watson, Kenmore, $45,745. Bids Oct. 14. Noted Oct. 21, C. D.—Sept. 19, E. N.-R.

N. Y., Marlboro — Central School Dist. 1, grading, excavation and foundations for school, to L. H. Swenson, Inc., 2 Cannon St., Poughkeepsie, $20,131. Total est. $371,426. **P.W.A.** Noted Oct. 31, C. D.—Nov. 7, E. N.-R.

†**N. Y., New York**—Treas. Dpt. at office Sup. Archt., Wash., D. C., constructing elevators Madison Square Postal Station, to Gurney Elevator Co., 109 West 64th St., $28,874.

†**N. Y., New York**—Treas. Dpt. at office Sup. Archt., Wash., D. C., constructing U. S. Post Office, to Wallin Concrete Corp., 103 Park Ave., $273,200. Bids Oct. 30. Noted Oct. 31, C. D.—Oct. 10, E. N.-R.

†**N. Y., New York**—Treas. Dpt. at office Sup. Archt., Wash., D. C., constructing bronze entrance to parcels post building, to W. S. Simpson, 1160 Cromwell Ave., $27,475.

†**N. Y., Oyster Bay**—Treas. Dpt. at office Sup. Archt., Wash., D. C., constructing U. S. Post Office, to N. P. Siechitani & Co., New Rochelle, $86,400. Noted Dec. 23, C. D.—Dec. 5, E. N.-R.

N. Y., Pavilion—Central School Dist., foundation for school, to Potter DeWitt Corp., Pavilion, $10,807. **P.W.A.** Total est. $167,812. Soon takes bids on superstructure for same. Noted Dec. 17, C. D.—Dec. 26, E. N.-R.

N. Y., Philadelphia—Union School Dist. 3, foundations for school, Sand St., to H. J. Wright, 128 Sterling St., Watertown, $16,622. Total est. $120,382. **P.W.A.** Bids Dec. 10. Noted Dec. 17, C. D.—Oct. 17, E. N.-R.

N. Y., Rochester—Bd. Educ., 13 South Fitzhugh St., heating and ventilating for School 4, Jefferson Terrace, to L. C. Gresens, 105 South Ave***painting, to Seebach-Kimbel, Inc., 336 St. Paul St. $2,938***roofing, to Smith Murray, Inc., 999 East Main St., $7,985***tile, marble and terrazzo, to Whitmore, Rauber & Vincinus, 51 Griffith St., $2,798***linoleum, to Allen Floor Covering Co., 426 Pearl St., Buffalo, $7,727***plumbing, to Bliss Plumbing & Supply Co., 300 Andrews St., $14,800***electrical work, to Dwyer Electric Co., 213 Monroe Ave. $7,979. **P.W.A.** No awards made on general contract (masonry) carpentry and stone. Noted Dec. 10, C. D.

†**N. Y., Rochester**—Treas. Dpt. at office Sup. Archt., Wash., D. C., constructing U. S. Post Office and Garage, to H. Stallman Sons Co., 135 Spring St. Est. $139,993. Bids Nov. 14. Noted Nov. 19, C. D.—Oct. 31, E. N.-R.

N. Y., Sherman—Bd. Educ., foundations for school, to C. Shellberg, 32 Brush St., Jamestown, $7,433. Total est. $155,420. **P.W.A.** Noted Dec. 11, C. D.—Oct. 24, E. N.-R.

N. Y., Tonowanda — Metzger Constr. Corp., general contractors, 429 Carlton St., Buffalo, plumbing for school for Bd. Educ., Tonowanda, to Frank & Miller, 79 Best St., Buffalo, $7,231***heating and ventilating, to F. G. Cook & Sons, 102 Deerhurst Park Blvd., Kenmore, $20,756***electrical work, to Ferguson Electric Constr. Co., 204 Oak St., Buffalo. **P.W.A.** Noted Dec. 11, C. D.—Dec. 19, E. N.-R., under "Contracts Awarded."

N. Y., Troy — Marinello & Stanco, general contractors, 6 Summitt Ave., Albany, metal lathing and plastering for Lansingburgh School, to Henderson-Johnson Co., 1460 Erie Blvd., Syracuse, for Bd. Educ., Troy. Total est. $35,000. **P.W.A.** Noted Dec. 10, C. D.—Dec. 12, E. N.-R.

N. Y., Weedsport—Swarthout & Rowley, general contractors, 548 Mouth Hope Ave., Rochester, reinforcing steel for high school, to Whiteacre Eng. Co., 42 East Ave., Rochester, for Union Free School Dist. 1. **P.W.A.** Noted Nov. 26, C. D.—Dec. 5, E. N.-R., under "Contracts Awarded."

N. Y., West Valley—Central School Dist. 4, West Valley, plumbing for school, to M. A. Speth, 11 Columbia Parkway, Buffalo***heating, to G. Zoltech, 123 Grape St., Buffalo*** electrical work, to Modern Electric Co., 659 Main St., Buffalo. **P.W.A.** Bids Dec. 4. Noted Dec. 17, C. D.—Dec. 26, E. N.-R., under "Contracts Awarded."

N. Y., Whitney Point—A. Berbussee, Jr., general contractor, Port Chester, incinerator for school for Central School Dist. 1, to E. C. Stearns & Co., 225 Oneida St., Syracuse*** roofing, to Central City Roofing Co., 730 Canal St., Syracuse***stone work, to Harding & Cogswell, Bloomington, Ind.***metal lathing and plastering, to Henderson-Johnson Co., 1460 Erie Blvd., Syracuse. Noted Dec. 9, C. D.—Dec. 12, E. N.-R., under "Contracts Awarded."

N. Y., Woodmere—Bd. Trustees School Dist. 14, excavation for Hewlett School and for Woodmere Grammer School, to G. Zara, Hewlett, $13,777 and $3,855 respectively. **P.W.A.** Noted Nov. 22, C. D.—Nov. 28, E. N.-R.

N. C., Black Mountain—H. L. Harris, secy. Bd. Trustees, Western North Carolina Sanatorium; constructing tuberculosis sanatorium, to Chas. W. Angle, Inc., Greensboro, $344,887. **P.W.A.** Noted Dec. 13, C. D.

†**N. C., Reidsville**—Treas. Dpt. at office Sup. Archt., Wash., D. C., constructing U. S. Post Office, to J. I. Barnes, Springfield, O., $163,300. Noted Dec. 30, C. D.—Nov. 28, E. N.-R.

O., Antwerp—Bd. Educ., constructing school building, to C. Knowlton, Bellefontaine, $115,000. J. Stewart, Bowling Green, archt. Noted Nov. 20, C. D.—Nov. 28, E. N.-R.

O., Cincinnati—Cincinnati Art Museum, Eden Park, 2 story art museum addition, to Ferro Concrete Constr. Co., 203 West 3rd St. Est. $250,000. Fosdick & Hilmer, Union Trust Bldg., engrs. Noted Nov. 20, C. D.—Nov. 14, E. N.-R.

★ **O., Cleveland** — Bd. Educ., constructing 3 story, basement, 110x140 ft. addition to West High School, 6908 Franklin Blvd., and 2 story, basement, 115x121 ft. school addition, West 54th and Biddulph Sts., to Hunkin-Conkey Constr. Co., 1740 East 12th St., $289,000 and $158,800 respectively***3 story, basement, 84x154 ft. elementary school, to H. E. Klefman Co., 3404 Lorain Ave. $94,700***2 story, basement, 42x48 ft. addition to Kinsman School, to L. W. Schmidt, 10,000 Granger Rd. $37,550*** 2 story, 42x153 ft. addition to Hough School, to Peck & Udell Constr. Co., 2341 Carnegie Ave. $77,989***42x86 ft., addition to Landon School, to G. F. Rutherford Co., 2725 Prospect Ave., $48,465***2 story, basement, 78x90 ft. addition to Waverly School, to Hebing Co., 1832 West 54th St. $67,855***2 story, 74x126 ft. addition to Bolton School, to R. P. Carbone, 2527 East 126th St. $107,450***2 story, 48x105 ft. addition to Jane Addams School, to J. Grant & Son, 3866 Carnegie Ave. $58,638, all brick, steel, concrete. Grand total $940,447.

O., Deer Park—Village, W. Hensing, mayor, constructing 2 story, basement, brick city hall, to Nolte-Tillar Bros. Constr. Co., 946 Blair St., Cincinnati, $23,000. **P.W.A.** Grunkmeyer & Sullivan, Cincinnati, archts.

O., Dover—City, power plant project, Contr. 8, circulating water pumps, and Contr. 14, boiler feed pump, to Ingersoll Rand, Williamson Bldg., Cleveland, $3,659 and $7,308 respectively***Contr. 12, forced draft fan, to B. F. Sturtevant, Hyde Park, Mass., $3,641*** Contr. 13, coal handling equipment, to Bartlett & Snow, 6200 Harvard Ave., Cleveland, $10,606***Contr. 17, ash hopper, to Allen Sherman Hoff Co., Phila., Pa., $6,745***Contr. 21-A, motor starters, to Electric Controller Mfg. Co., 2698 East 79th St., Cleveland, $2,636. Grand total $34,595. **P.W.A.**

O., East Palestine—Town, general contract constructing Senior High School, 2 story, basement, to Felix Pesa & Sons, 745 Andrews Ave., Youngstown, $130,200***plumbing and heating, to Scholl-Coffin Co., 12 Hogue St., Youngstown, $34,646***electrical work, to A. F. Bell Electrical Co., 274 West Rayen Ave., Youngstown, $8,242. Grand total $173,088. Est. $200,000. **P.W.A.** Noted Dec. 27, C. D.—Jan. 2, E. N.-R.

O., Middleport—Bd. Educ., constructing high school, to Van Gundy Beck Co., Lancaster, $119,334***electrical work, to Dawson Electric Co., Pomeroy***heating and ventilating, to Columbus Heating & Ventilating Co., 400 Dublin Ave., Columbus. **P.W.A.**

O., Toledo—School Bd. (a) general contract, (b) heating and plumbing, (c) electrical work, (d) heating (e) plumbing in (1) Fulton School addition, (2) Indiana School addition, (3) Newton School addition (4) Newbury School addition, (5) Monroe School addition, (6) Glenwood School addition, to Comte Naumann, 912 Summit St., (a1) $38,000, (b2) $31,300***to Pioneer Plumbing & Heating Co., 136 West Woodruff St., (b1) $10,500, (b6) $8,300***to Overmyer Electric Co., Toledo (c1) $1,879, (c3) $1,781***to W. G. Coyle Co., 535 Knower St. (b2) $10,857***to Paratschek & Furey, 4214 Bowen Rd. (c2) $2,287, (c4) $1,896*** to H. J. Spicker, 1418 Elms St. (a3) $31,500, (a4) $34,000, (a5) $32,000***to Kaighan & Hughes Toledo, (b3) $19,792, (d4) $18,515 ***to J. Thom, 340 Prouty Ave., (e4) $1,790 ***to D. McDermid, 309 West Bancroft St. (b5) $16,981***to Romanoff Electric Co., 105 Broadway, (c5) $2,407***to Saunders Electric Co., Nicholas Bldg., Toledo, (c6) $2,088. Grand total $265,876. **P.W.A.**

†**O., Wapakoneta**—Treas. Dpt. at office Sup. Archt., Wash., D. C., constructing U. S. Post Office, to G. H. White Constr. Co., 603 G. F. Harter Bank Bldg., Cincinnati, $47,520.

O., Wyoming—Bd. Educ., L. L. Townley, secy., constructing 3 story, basement addition, two 3 story classroom wings and alteration (proposed gymnasium excluded) on Wyoming Ave., to E. Honnert, Mt. Healthy, $80,000*** plumbing, to J. J. Doud, 325 East 4th St., Cincinnati, $8,000***heating, to T. J. Conner, 3290 Spring Grove Ave., $17,543***electrical work, to Fogarty Electric Co., 946 Blair St., Cincinnati, $6,827. Grand total $112,370. **P.W.A.** Noted Nov. 21, C. D.—Nov. 28, E. N.-R.

Ore., Estacada—City Council, general contract 2 story, basement, brick, steel high school, to Allyn & Powers, Portland, $172,685. Bids Dec. 14.

†**Ore., Marshfield**—Treas. Dpt. at office Sup. Archt., Wash., D. C., constructing U. S. Post Office, to Hoffman Constr. Co., 715 Southwest Columbia St., Portland, $121,800. Bids Nov. 29. Noted Dec. 3, C. D.—Oct. 31, E. N.-R.

Ore., Oregon City—Clackamas Co., 3 story, court house, to G. L. Hord, Counch Bldg., Portland, $226,400. Noted Jan. 3, C. D.—Aug. 22, E. N.-R.

Pa., Kulpmont — Kulpmont School Dist., to Albert Boyer, Northumberland, general contract constructing new school, $101,200***to John Maleski, Kulpmont, electrical work, $6,553; heating and ventilating, $20,690; plumbing, $10,475. Grand total $138,918. Noted Jan. 7, C. D.—Jan. 10, 1935, E. N.-R.

Pa., Mt. Carmel—School Dist. of Mt. Carmel, general contract constructing Junior High School, to Berwick Lumber & Supply Co., Berwick, $100,954***eleterical work, to A. Rockfeller Co., Mt. Carmel, $7,795***heating and ventilating, to John Maleski, Kulpmont, $19,980***plumbing, to Joseph McElwee, Mt. Carmel, $8,681. Grand total $137,410. **P.W.A.**

†**Pa., Pittsburgh**—Treas. Dpt. at office Sup. Archt., Wash., D. C., constructing U. S. Post Office, Wilkinsburg Branch, to Blauner Constr. Co., 189 West Madison Ave., Chicago, Ill., $86,260. Bids Dec. 13. Noted Dec. 18, C. D.—Dec. 5, E. N.-R.

†**Pa., Pittsburgh**—Treas. Dpt. at office Sup. Archt., Wash., D. C., constructing South Hills Branch Post Office, to Spence Bros., 201 Arcade Bldg., Saginaw, Mich., $71,800. Bids Nov. 21. Noted Nov. 27, C. D.—Oct. 31, E. N.-R.

Tex., Austin — Bd. Regents University of Texas, c/o J. W. Calhoun, comptroller, general contract 3 story, basement, 45x209 ft., brick, rein.-con. women's dormitory, to H. H. Moeller, 1211 Willow St., San Antonio, $168,393*** painting, to L. E. Travis, 333 Kayton Ave., San Antonio***general contract 3 story, basement, 45x209 ft., brick, stone, hollow tile, rein.-con. men's dormitory, plain found., to J. E. Morgan & Sons, 210 North Campbell St., El Paso, $172,203. **P.W.A.** Bids Nov. 3. Noted Dec. 6, C. D.—Nov. 7, E. N.-R.

Tex., Kilgore—Bd. Educ., Ind. School Dist., c/o J. T. Crim, pres., superstructure 2 story, semi-fireproof high school, to Hill & Combs, San Antonio, $126,000; substructure, to O. L. Crigler, Kilgore, about $24,000. Total est. $200,000. **P.W.A.** Noted Nov. 29, C. D.

†**Tex., Lufkin** — Treas. Dpt. at office Sup. Archt., Wash., D. C., constructing U. S. Post Office, to Werner Co., Shreveport, La., $104,900. Bids Nov. 27. Noted Dec. 2, C. D.—Oct. 31, E. N.-R.

†**Tex., Sabine Pass.** — Treas. Dpt. at office Sup. Archt., Wash., D. C., constructing quarantine station, to D. M. Picton & Co., Port Arthur, $32,987.

†**Tex., Waco** — Treas. Dpt. at office Sup. Archt., Wash., D. C., electric elevator plant in U. S. Post Office to Westinghouse Electric Co., 1500 North Branch St., Chicago, Ill., $25,912. Bids Dec. 6. Noted Dec. 16, C. D.—Nov. 21, E. N.-R.

†*Federal Government.*

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Public Buildings (Continued)

†**Utah, Sunset**—U. S. Army, Wash., D. C., constructing, rehabilitating army arsenal, day labor. W.P.A. project. $300,000.

†**Vt., North Troy**—Treas. Dpt. at office Sup. Archt., Wash., D. C., constructing U. S. Post Office, to H. P. Cummings Constr. Co., 14 Prospect St., Ware, Mass., $84,500. Bids Nov. 27. Noted Dec. 2, C. D.—Oct. 31, E. N.-R.

Wash., Ellensburg — State Normal School, constructing school, to Roberts & Johnson, Fidelity Bldg., Tacoma, $175,332•••electrical work, to NePage McKenny Co., 804 6th Ave. S., Seattle, $13,064•••mechanical work, to A. G. Rushlight & Co., 407 South East Morrison Ave., Portland, Ore. $37,172. Grand total $225,568. P.W.A. Noted Dec. 18, C. D.—Dec. 26, E. N.-R.

†**Wash., Odair**—Bureau Reclamation, Denver, Colo., furnishing materials for 11 prefabricated court type residence-groups for 3 houses each, at Grand Coulee Dam, to White Pine Sash Co., E 4005 Bway., Spokane, $20,471. Bids Nov. 26, awarded Dec. 13. Noted Dec. 10, C. D.—Nov. 21, E. N.-R.

Wash., Seattle—See "Unclassified."

Wash., Sequim—School Dist., plumbing in school, to J. Caven, 217 North Laurel, Port Angeles, $4,949. P.W.A. W. Wallis, Lyon Bldg., Seattle, engr.

†**W. Va., Huntington**—Treas. Dpt. at office Sup. Archt., Wash., D. C., constructing U. S. Post Office addition, to A. Blair, Montgomery, Ala., $248,163. Bids Dec. 3. Noted Dec. 10, C. D.—Nov. 21, E. N.-R.

Wis., Campbellsport—Joint School Dist. 2, excavation for sewer line for Junior High School, to Jaeger Bros., Inc., West Bend, $3,200. Bids Dec. 14, awarded Dec. 14. Auler, Jensen & Brown, Oshkosh, archts.

Wis., Granville — School Dist. 2, A. Loun, clk., electrical work for 2 story, 45x54 ft. school addition, to Reliance Electric Co., 1034 West Somers St., Milwaukee, $714; plumbing, to Wenzel & Henoch Co., 1524 North 27th St., Milwaukee, $1,399. P.W.A. Bids Dec. 16, awarded Dec. 16. L. Ernest, 3525 West North Ave., Milwaukee, archt.

Wis., Manitowoc—City, excavation for Junior High School, to Muth-Knechtel Constr. Co., Manitowoc, $1,850. P.W.A. Bids Dec. 13. F. W. Raeuber, Manitowoc, archt.

Wis., Markeson—Joint School Dist. 3, excavation and underpinning for school, to A. W. Arndt, Markesan, $3,640. Bids Dec. 14, awarded Dec. 14. Auler, Jensen & Brown, Oshkosh, archt.

Wyo., Cheyenne—State, Capitol Bldg., Cheyenne, general contract state supreme court building and library building, to J. W. Howard, Cheyenne, $316,000. P.W.A. Bids Dec. 2, W. Dubois, Hynds Bldg., archt.

T. H., Honolulu—Kula Sanitarium, c/o C. W. Dickie, archt., Honolulu, general contract 4 story, rein.-con. sanitarium, to E. E. Black Ltd., Honolulu, $171,185. Noted Dec. 26, C. D.—Dec. 5, E. N.-R.

★ **B. C., Vancouver** — City, constructing 12 story, basement, rein.-con., stone city hall, plain found., 10th Ave. and Cambie St., to Garber Halls-Aldinger Co., Ltd., Taylor St., $930,000. Noted Dec. 19, C. D.

B. C., Vancouver—Vancouver General Hospital, 10th and Heather Sts., constructing 3 story, basement, rein.-con., steel tuberculosis hospital, to E. J. Ryan Contg. Co., Ltd., 445 Granville St., $192,391. Est. $179,394. H. Whittaker, Dpt. P. Wks., Victoria, archt. Noted Nov. 15, C. D.—Nov. 21, E. N.-R.

Que., Quebec—Delphie Maranda, general contractor, Quebec, electrical work, plumbing and heating for shops, for Dpt. Marine, Ottawa, Ont., to Albert Asselin, 37 Hominie St. Noted Sept. 4, C. D.—Sept. 12, E. N.-R.

COMMERCIAL BUILDINGS

PROPOSED WORK

★ **Ala., Birmingham**—S. H. Kress & Co., 114 5th Ave., New York, plans by E. Sibbert, 114 5th Ave., New York, department store, 1900 3rd Ave. $500,000.

Calif., Los Angeles—Westlake Medical Building Assn., 1913 Wilshire Blvd., G. C. Brush, mgr., sketches by Parkinson & Parkinson, 808 Title Insurance Bldg., 13 story, brick, steel office building addition, Wilshire Blvd. and Westlake Ave. Est. exceeds $105,000.

★ **Calif., Los Angeles**—North Vermont Ave. Impvt. Assn., F. H. Partridge, mgr., 360 South Berkeley St., Pasadena, retained Walker & Eisen, archts., 708 Pacific Commerce Bldg., in an advisory and consulting capacity to design a general community scheme for proposed improvements to buildings on North Vermont Ave. between Franklin Ave. and Los Feliz Blvd., between 75 and 80 buildings with total frontage of 1,960 ft. $2,500,000. Los Angeles Planning Comn. have bequested to rezone property by manager.

Calif., San Rafael—Hotel Rafael Corp., c/o A. B. Talbot, 251 Kearny St., San Francisco, archt., making plans 4 or 5 story fireproof hotel. To exceed $115,000.

Conn., Hamden—Robbins & Johnson, Strand Theatre, Dixwell Ave., New Haven, plans brick, steel theatre, Dixwell Ave. and Helen St. $105,000. Architect not appointed.

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Conn., Waterbury — Norris Kosersky, 56 North Main St., plans real estate development, incl. 25 new homes, 26x39 ft. or 21x29 ft., Lindale Ave. $105,000. Private plans.

Mass., Newton—Temple Emanuel, R. Cohn, pres., 1 Federal St., Boston, I. Nelson, chn. Building Com., 250 Stuart St., Boston, plans brick, concrete, stone, granite temple, educational and community center, Ward and Ash Sts. To exceed $150,000. B. Goldberg, c/o owner, archt.

Mich., Kalamazoo—Kalamazoo College, C. T. Goodsel, pres., plans by A. Embury, 2nd, 150 East 61st St., New York, N. Y., 3 story, basement, brick, steel, rein.-con. dormitory, plain found. $150,000.

N. J., New Brunswick—Walter Reade, c/o T. W. Lamb, archt., 701 7th Ave., New York, bids about Mar. 7, theater. $400,000.

N. Y., Chappaqua—Walter King Cooley, 43 Prospect Park Ave., Mount Vernon, plans group 1 and 2 story, frame, brick dwellings on 18 acre tract, Begg Park Estates. To exceed $100,000.

N. Y., Douglaston—United Associates, Northern Blvd. and 245th St., plans group 1 and 2 story, dwellings, Northern Blvd. and 245th St. To exceed $100,000.

N. Y., Forest Hills—D. Isenberg, 451 Albany Ave., Brooklyn, plans by Cohn Bros., 191 Joralemon St., Brooklyn, 6 story, brick apartment, 73rd St. near Austin St. $200,000.

N. Y., Freeville—George Junior Republic, A. Forbes, pres., purchased large tract of land adjoining their property and plans constructing School of Aeronautics. To exceed $105,000. Architect not appointed.

N. Y., Jackson Heights—Seventy-Third St. Jackson Heights Corp., c/o A. Shanik, 26 Court St., Brooklyn, plans by Kavy & Kavovitt, 16 Court St., apartment, 73rd St. near 35th Ave. $150,000.

N. Y., Merrick—Merrick Homes Development Co., Merrick Rd., plans group dwellings, Merrick Rd. to exceed $200,000.

N. Y., New York—Alden Properties, Inc., 565 5th Ave., plans by J. M. Felson, 250 West 57th St., constructing 6 story, apartment, 205th St. and Grand Concourse. $250,000.

N. Y., New York—Bank for Savings, 280 4th Ave., plans by L. E. Ordwein, c/o owner, altering heating in three 5 story apartment, 334 East 71st St. $30,000.

N. Y., New York—Chateau Thierry, c/o A. Smadbeck, 85th St. and Riverside Dr., plans by F. B. Platt & Bro., 221 West 57th St., altering plumbing and heating in 8 story apartment, 85th St. and Riverside Dr. To exceed $40,000.

N. Y., New York—Corporation, c/o C. J. Miller, 30 West Kingsbridge Rd., plans 6 story apartment, University Ave. To exceed $150,000.

★ **N. Y., New York** — Corporation, c/o E. Ellinger, 16 East 52nd St., plans by J. M. Felson, 250 West 57th St., 12 story, 78x133 ft. apartment, 137 East 38th St. $500,000.

N. Y., New York — Gerard-One Hundred Fifty-Third Street Corp., 1005 Walton Ave., plans by R. T. Golden, 135 West 79th St., 6 story apartment, Gerard Ave. and East 153d St. $235,000.

N. Y., New York—Forahug Realty Corp., c/o Sugarman & Berger, archts., 17 East 49th St., plans altering heating in 7 story apartment, 114th St. and Morningside Dr. To exceed $40,000.

N. Y., New York—International Committee Y.M.C.A., 347 Madison Ave., plans by Clinton & Russell, 70 Pine St., altering heating and plumbing in 5 story apartment, 233 East 11th St. $35,000 with fixtures.

N. Y., New York—Majestic Properties, Inc., A. A. Silberberg, 285 Madison Ave., plans 6 story apartment, Grand Concourse near 197th St. $150,000 or more. Architect not appointed.

N. Y., New York—Merchants Salvage Corp., 78 East 118th St., or c/o E. Levitt, 1741 Madison Ave., plans altering heating 6 story apartment, 78 East 118th St. $28,000. Architect not appointed.

N. Y., New York — Metropolitan Savings Bank, 1 3rd Ave., plans by A. A. Tearle, 10 West 46th St., New York, altering heating, plumbing in two 5 story apartments, 16 West 119th St. $30,000 with fixtures.

N. Y., New York—One Thousand Eight Hundred Fifteen Monroe Avenue Corp., 1476 Walton Ave., plans by H. H. Lilien, c/o owner, 6 story, 85x155 ft., brick apartment, Monroe Ave. and East 175th St. $300,000.

N. Y., New York—Romax Realty Corp., 259 West 57th St., plans by J. M. Felson, 250 West 57th St., 6 story, brick apartment, 141 Seaman Ave. $150,000.

N. Y., New York—Three Hundred Ninety-Five 6th Avenue Corp., 535 5th Ave., plans by C. B. Storm, c/o owner, altering heating in apartment and store, 395 6th Ave. $30,000.

N. Y., New York—Trinity Church Corp., 74 Trinity Pl., bids about March or later, altering elevators and heating in hotel, 56 Park Ave. To exceed $30,000. Francisco & Jacobus, 511 5th Ave., archts. Noted Nov. 1, C. D.—Nov. 7, E. N.-R.

N. Y., New York—Wincrest Realty Corp., H. I. Litwin, pres., c/o W. L. Rosen, 369 East 149th St., plans 6 story apartment, University Ave. and Eames Pl. $150,000 or more. Site acquired.

N. Y., St. Albans—W. Adleman, 115th Ave. and 115th Rd., bids after Mar. 1, constructing group dwellings, 115th Ave. and 115th Rd. A. E. Allen, Garden City, archt. Noted Dec. 18, C. D.—Jan. 2, E. N.-R.

N. Y., St. Albans—Florence Abrams, 89-24 Sutphin Blvd., Jamaica, plans by J. E. Child, 89-64 163rd St., Jamaica, constructing group frame dwellings, 120th Ave. and 178th St. $140,000.

N. Y., Scarsdale—Certified Homes, Inc., c/o N. W. Zaubier, Edgemont Hills, Central Ave., plans by S. Heller, c/o owner, constructing group dwellings on 100 lot site, Central Ave. To exceed $100,000. Site acquired.

N. Y., Scarsdale—Everett Jacobs, Fenimore Rd., plans group fifty 1, 2 and 3 story dwellings, Harney Rd. To exceed $100,000.

N. Y., Schenectady—St. Lukes Roman Catholic Church, 1202 State St., plans by J. J. O'Shaughnessy, 146 State St., Albany, constructing church, State St. $140,000.

N. Y., Springfield—Linden Park Homes, 229 East 96th St., Brooklyn, plans by A. E. Allen, Garden City, 1 story, 24x34 ft. frame dwellings, 119th St. To exceed $100,000.

N. Y., Sunnyside—Sun Ray Apartments, Inc., 1935 66th St., Brooklyn, plans by Cohn Bros., 191 Joralemon St., Brooklyn, construct apartments, 41st St. and 47th Ave. $125,000.

N. Y., Syracuse — Schine Chain Theatres Corp., 40 Main St., Gloversville, plans by P. M. Hulsken & Lyman T. Strong, 505 Savings Bldg., Lima, O., reconstructing theatre destroyed by fire, Fayette St. $100,000-$150,000.

N. Y., Yonkers—Julia Dyckman Andrus Memorial Home, North Bway., plans by M. H. McGuire, 677 Palisade Ave., constructing 2 brick, steel additions to home, plain found., 1156 North Bway., $75 000 each.

Okla., Ada—Chamber of Commerce, sketches by A. S. Ross, Ada., 3 story, basement hospital. $300,000.

Pa., Phila.—S. K. Allman, agent, plans by A. Carroll, 1310 Spruce St., & S. Jelinek, Phila., theatre, office store and apartment building, 77th St. and Ogontz Ave. Theatre to be known as "The Camera." Est. $130,000.

Tex., Port Arthur—Jefferson Amusement Co., Peoples Theatre, plans air conditioning system in theatre. Est. about $28,000. Total alterations est. $50,000.

Alta., Viking—Viking Hotel Ltd., plans rebuilding hotel destroyed by fire. $100,000 loss.

B. C., Prince Rupert—General Hospital Bd. making plans constructing 100 bed hospital. $300,000. Maturity in spring.

Ont., Morrisburg—See "Unclassified."

Ont., Sarnia — Famous Players Canadian Corp. Ltd., Royal Bank Bldg., Toronto, plans by Kaplan & Sprackman, 305 Dundas St. W., and soon takes bids 1 story, 75x95 ft. picture theatre, West Christina St. $110,000. Noted Nov. 27, C. D.—Dec. 6, E. N.-R.

Ont., Toronto — Casino Theatres, Toronto, Ltd., c/o Kaplan & Sprackman, archts., 305 Dundas St. W., making plans 1 story, brick, steel theatre, 87 Queen St. W. $110,000. Contract for steel, to Frankel Bros., Don Roadway, Toronto.

Ont., Windsor — Windsor Sanatorium, Prince Rd., Dr. W. M. McNeeley, supt., plans by J. C. Pennington, 1110 Victoria St., constructing addition to sanatorium. $190,000.

BIDS ASKED

D. C., Wash.—Jan. 14, by G. C. Murphy Co., and E. M. Mack, 531 5th Ave., McKeesport, Pa., 3 story, basement, 54x200 ft., steel, concrete, brick store, 3128-30 14th St. N.W. $200,000. H. E. Crosby, 531 5th Ave., McKeesport, Pa., archt.

N. J., Maplewood—See "Contracts Awarded."

N. Y., Brooklyn—English Evangelist Church of Good Sheperd, 4th Ave. and 74th St., bids about Mar. 1 or later, constructing 3 story Sunday school, 4th Ave. and 74th St. $120,000. Corbett, Harrison & MacMurray, 130 West 42nd St., New York, archts. Noted Mar. 16, 1933. C.D.—Mar. 23, 1933. E.N.-R.

N. Y., Jamaica—See "Contracts Awarded."

N. Y., Queens Village — See "Contracts Awarded."

CONTRACTS AWARDED

Calif., Beverly Hills — J. L. Warner, 1871 Angelo Dr., reconstructing 2 story, 15 room residence, 1871 Angelo Dr., to L. D. Richardson & Co., 9437 Santa Monica Blvd., approximately $110,000. Noted Dec. 24, C. D.

★ **Calif., Los Angeles**—Sears Roebuck & Co., 2650 East 9th St., to Ford J. Twaits Co., 816 West 5th St., Los Angeles, 3 story, basement, 45x150 ft., rein.-con. department store addition, Santa Monica and Western Ave., approximately $150,000; 3 story basement, 45x300 ft., rein.-con., structural steel department store addition, Vermont and Slauson Aves., approximately $150,000; 3 story, basement, 50,000 sq.ft. floor space department store, 2650

†*Federal Government.*

Commercial Buildings (Continued)

East 9th St., approximately $200,000. Grand total approximately $500,000. Private plans. O. G. Bowen, 1144 South Grand Ave., engr.

Mass., Salem—Lawson W. Oakes Inc., general contractors, 100 Halleck St., Boston, excavation in connection with construction of office building, Crombie St., to Jas. J. Welch & Co., 15 Front St., Salem, for Holyoke Mutual Fire Insurance Co., A. Smith, agt., 114 Washington St. Noted Dec. 20, C. D. — Dec. 26, E. N.-R. under "Contracts Awarded."

Mo., Festus — Ursuline Sisters, Sappington Rd., Kirkwood, general contract 3 story, basement, 40x300 ft., rein.-con., brick noviate for nuns, near here, to M. J. Lawlor, 5632 Terry Ave., St. Louis.

N. J., Hasbrouck Heights—P. E. Realty Corp., Harrison Ave. and Hudson Blvd., group of dwellings, Harrison Ave. and Hudson Blvd., separate contracts now being awarded. To exceed $100,000. Noted May 20, C. D.—May 23, E. N.-R.

N. J., Maplewood—Corp., c/o R. S. Darling, East Orange, constructing group of 15 dwellings in vicinity of Wyoming Ave. and Durand Rd., day labor and separate contracts. Bids late in February. To exceed $140,000. Noted Dec. 18, C. D.—Dec. 19, E. N.-R.

N. Y., Flushing—G. M. Seglin, 60 East 42nd St., New York, general contract group 1 and 2 story, brick dwellings on 300 lot site, Bway, Flushing east addition, to Seglin Constr. Co., Inc., 620 East 42nd St., New York. To exceed $100,000. Contractor awarding separate contracts. Private plans.

N. Y., Jamaica—Wolosoff Bros., 69-50 Ingram St., Forest Hills, group 46 dwellings, Grand Central Parkway and Daniel St., day labor and separate contracts. To exceed $150,000. Noted Dec. 13, C. D.—Dec. 19, E. N.-R.

N. Y., Mount Vernon—Sidney Wollman and Woods Westchester Corp., California Rd., constructing group 15 dwellings, California Rd., separate contracts now being awarded. To exceed $300,000.

N. Y., New York — New York University, School of Engineering, University Heights, general contract 3 story, steam, electric and power plant and laboratory, to Skinner, Cook & Babcock, 60 East 42nd St. Est. $400,000. General contractors awarded contract 280 tons structural steel, to Bethlehem Fabricators, Inc., Bethlehem, Pa. Noted Nov. 18, C. D.—Nov. 21, E. N.-R.

N. Y., New York—Bowery Savings Bank, 110 East 42nd St., altering heating in 10 story apartment, 15 East 8th St., to W. and W. F. Crockett, 430 East 54th St. Est. $50,000. Noted Oct. 15, C. D.—Oct. 10, E. N.-R.

N. Y., Queens Village—S. G. Wanes, 109-54 118th St., Ozone Park, constructing group dwellings, 113th Ave. and 113th Rd., day labor and separate contracts. To exceed $150,000. Soon takes bids on materials. Noted Dec. 18, C. D.—Dec. 26, E. N.-R.

N. Y., Rochester—A. W. Hopeman & Sons Co., general contractors, 569 Lyell Ave., structural steel for constructing chapel, dormitory for married students, and dormitory for missionaries for Colgate-Rochester Divinity School, 1100 South Goodman St., to F. L. Heughes & Co., 1029 Lyell Ave. Noted Dec. 18, C. D.—Dec. 26, E. N.-R., under "Contracts Awarded."

N. Y., Rochester—A. W. Hopeman & Sons, general contractors, 569 Lytell Ave., excavating for dormitory for married students at Colgate Rochester Divinity School, 1100 South Goodman St., to F. J. Hines, 79 Monteroy Rd., Rochester***plumbing and heating, to Wright & Alexander, 21 Otsego St.***reinforcing steel, to Genesee Bridge Co., 344 West Ave. Noted Dec. 18, C. D.—Dec. 26, E. N.-R., under "Contracts Awarded."

N. Y., Sayville—Oystermens Bank & Trust Co., Sayville, plans group dwellings, Elm St. near Colton Ave., to Oakhaven Homes, Inc., East Islip. Est. $100,000 or more.

N. Y., St. Albans—Federal Homes, Inc., 160-16 Jamaica Ave., Jamaica, group 1 story, 24x38 ft., frame dwellings, 221st St. and 116th Ave., day labor and separate contracts. To exceed $100,000. A. E. Allen, Garden City, archt. Noted Nov. 27, C. D.—Dec. 5, E. N.-R.

N. Y., Troy—Philip Casey, Jr., general contractor, 337 4th St., Troy, structural steel for bank, to Westside Structural Steel Co., 19th St., Watervliet, for Union Natl. Bank, 56 4th St., Troy; stone and granite, to Adam Ross Cut Stone Co., Inc., 1003 Bway., Albany. Total est. $100,000. Noted Oct. 11, C. D.—Oct. 17, E. N.-R., under "Contracts Awarded."

T. H., Honolulu — Consolidated Amusement Corp., Honolulu, constructing rein.-con. theatre, to E. E. Black, Ltd., Honolulu, $115,500. C. W. Dickey, 405 S. M. Damon Bldg., archt.

INDUSTRIAL BUILDINGS

PROPOSED WORK

Ala., Gadsden — PLANT — Dwight Mfg. Co., Gadsden, soon lets contract textile plant and addition. To exceed $40,000.

Calif., Lodi—WINERY—J. De Gorgio, et al., c/o Earl Fruit Co., Lodi, plans winery, 3,000,000 gal. tankage capacity. Architect not appointed.

†Federal Government.

Calif., Long Beach—FACTORY—Sencer Kellog & Sons, Buffalo, N. Y., acquired 6 acre site south of Cerritos Channel on the west side of Ford Ave. and making plans erection of new factory for manufacture of linseed oil.

Calif., Los Angeles—CREAMERY—H. J. Boyle, 3402 Avalon Blvd., plans by Nordtrom & Anderson, 608 Transamerica Blvd., 1 story, basement, 80x105 ft., concrete tile Class C creamery building, 3100 South Grand Ave. Est. $36,000. Applied for building permit.

Calif., Los Angeles—MARKET—J. Schenck, c/o United Artists Corp., 1041 North Formosa St., plans by Walker & Eisen, 708 Pacific Commerce Bldg., and soon takes bids one story and part 2 story, 127x186 ft., rein.-con., steel market, Vermont and 6th Sts. $75,000.

Calif., San Jose—STORAGE—First National Bank of San Jose plans storage, $28,000 or more. Architect not appointed. Lambert Marketing Co., Bassett St., lessee.

Calif., San Jose—WAREHOUSE, etc.—Mrs. E. J. Matracia, 65 South 8th St., plans rebuilding warehouse and storage, $30,000 or more. **Maturity indefinite.** Architect not appointed. Wellman-Peck, 65 South 8th St., lessee.

★ **Calif., Southgate**—PLANT—Albert Kahn, Inc., archts. and engrs., Central Bldg., Detroit, Mich., soon lets contract for General Motors Plant, 560x840 ft., on 43 acre site here, incl. buildings, concrete loading deck, pumphouse and storage tanks, Santa Fe Ave. and Tweedy Blvd., for General Motors, Inc., Central Bldg., Detroit, Mich. $2,500,000. Noted Nov. 4, C. D.—Nov. 7, E. N.-R., under "Los Angeles."

Calif., Woodbridge—WINERY—Del Rio Winery, C. Skinner, J. Graffigna, W. E. Garrison and G. Chapdelain, Woodbridge, plans winery. To exceed $40,000. Architect not appointed.

Conn., Bridgeport—FACTORY—Hemco Division Bryant Electric Co. plans by Fletcher-Thompson, Inc., 1336 Fairfield Ave., Bridgeport, 1 story, 90x200 ft., brick, steel plastic moldings factory, Railroad Ave. $80,000. Noted Dec. 18, C. D.

Fla., Panama City—WAREHOUSE—Railway Express Agency, 230 Park Ave., New York, plans warehouse. $40,000 or more.

Ill., Batavia—PLANT—Campana Corp., Batavia, plans plant addition. To exceed $100,000.

Ill., Chicago—PLANT—Gordon Baking Co., 2303 East Bernor St., Detroit, Mich., plans plant improvements and additions, 5324 South Federal Ave. $150,000. **Maturity in February or later.**

★ **Ill., Chicago**—PLANT—Sherwin Williams Co., 101 Prospect Ave. N.W., Cleveland, O., plans plant addition. To exceed $500,000. Architect not appointed.

Ind., Columbus—PLANT—Noblitt-Sparks Industries plans altering and equipping former plant of recently acquired Lincoln Chair Co. for assembly plant. $28,000 or more.

★ **Ind., Lawrenceburg**—DISTILLERY—Shenley Corp., 20 West 40th St., New York, 4 story, brick, steel, concrete distillery addition. $800,000. C. J. Kiefer, supt. construction, Schmidt Bldg., Cincinnati, O.

Ind., Terra Haute — PLANT — Indiana Wood Preserving Co., Terre Haute, plans altering and repairing plant. Est. about $35,000.

Ia., Marshalltown—POWER PLANT, etc.—Roberts & Oake, West 45th St. and Racine Ave., Chicago, Ill., plans power and heating plant for packing plant addition. $50,000.

Kan., Wellington — SHOPS, etc. — Sumner Co. plans shops and service building. $40,000.

Ky., Lexington — ABBATOIR — Corporation, c/o J. T. Ruddy, 1592 Teakwood St., Cincinnati, O., plans abbatoir and slaughter house alterations. $50,000.

Ky., Putney—MILL—Intermountain Lumber Co. plans rebuilding lumber mill destroyed by fire. $35,000 or more. $200,000 loss. Architect not selected. **Maturity indefinite.**

Louisiana — PLANT — Continental Oil Co., Lake Charles, plans natural gasoline plant, Tepetate oil fields. To exceed $50,000. **Maturity indefinite.** Architect not appointed.

Md., Baltimore — DAIRY PLANT — Green Spring Dairy, Inc., 5411 Harford Rd., plans dairy plant. To exceed $28,000. **Maturity after Jan. 1.**

Md., Baltimore—PACKING PLANT—Armour & Co., Union Stockyards, Chicago, Ill., plans altering and extending Kaufman & Co. packing plant recently acquired. $28,000 or more with equipment. **Maturity indefinite.**

Md., Baltimore—PLANT—Columbia Specialty Co., 1508 Fay St., plans plant improvements and addition. Est. $28,000 or more.

★ **Md., Belcamp** — PLANT — T. & A. Bata, Zlin, Czechoslovakia, plans shoe manufacturing plant. To exceed $1,000,000. **Maturity indefinite.** Architect not appointed.

Mass., Salem—DAIRY PLANT—H. P. Hood & Sons, C. Y. Nourse, in charge, 494 Rutherford Ave., Charlestown (Boston), plans brick, steel dairy plant, plain found., Bridge St. Est. $100,000. Private plans.

Mich., Detroit—STORAGE—Briggs Mfg. Co., 11631 Mack St., plans by Giffels & Vallet, 1000 Marquette Bldg., constructing dye and storage building. To exceed $30,000.

Mich., Detroit — PLANT BETTERMENTS — Gordon Baking Co., 230 East Vernor St., plans plant betterments and additions. To exceed $150,000. **Maturity indefinite.** Architect not appointed.

★ **Mich., Grand Rapids**—DIE PLANT—General Motors Corp., Grand Rapids Div. Stamping, Grand Rapids, plans 2 story and 6 story, basement 400,000 sq. ft. floor space, brick, steel, rein.-con. buildings for die manufacture and body stampings, plain founds. $7,000,000. Private plans.

Mich., Muskegon—CRACKING UNIT—Old Dutch Refining Co., J. Borden, pres., plans installation of new cracking unit at Muskegon oil refinery, constructing 70 mi. oil pipe line from Muskegon to Crystal and other central Michigan oil fields. $450,000. **Maturity early in 1936.** Project to be financed by preferred stock issue.

Mo., Morehouse — PLANT — Himmelberger-Harrison Mfg. Co. plans repairing and altering plant. Fire loss $50,000. Architect not appointed.

Neb., Scottsbluff — PLANT — Platte Valley Packing Co. plans reparing and altering plant. $50,000. Architect not appointed.

N. J., Newark—STORAGE, etc.—J. H. Reinfeld, 63 Vassar Ave., plans 2 story storage and distribution, on Frelinghuysen and Noble Sts. $45,000 or more. Site acquired.

N. Y., Brewster—STORAGE, etc.—New York State Electric & Gas Co., East Main St., Albany, soon lets contract reconstructing storage and distribution plant. $125,000. Private plans. Noted Dec. 2, C. D.—Dec. 5, E. N.-R.

N. Y., Brooklyn—FACTORY—Kienle & Co., 41 Nassau St., plans by W. H. Gompert, 40 East 49th St., altering 1 story, brick factory, 51 Nassau Ave. $40,000 with equipment.

N. Y., Buffalo—WAREHOUSE, etc.—Witkop & Holmes, Inc., lessee, 511-15 Washington St., plans altering 5 story warehouse, 379-383 Washington St., and constructing 2 story warehouse for grocery and department store, 34-38 Eagle St. $500,000.

N. Y., Buffalo—PLANT—William Simon Brewery, 705 Clinton St., plans bottling plant. $50,000.

N. Y., Cleveland—PLANT—Great Lakes Box Co., 7275 Wentworth Ave., plans plant storage. $28,000 or more. Architect not appointed.

N. Y., Corning—FACTORY—Corning Glass Wks. plans 2 story, basement, 180x240 ft., steel factory, plain found. To exceed $28,500. Private plans.

N. Y., Long Island City—BAKERY—Gordon Baking Co., 42-25 21st St., Long Island City, and 2303 East Vernon St., Detroit, Mich. plans constructing and improving bakery addition. $150,000 or more

N. Y., Long Island City—PLANT—Pepsi-Cola Co., 47-31 33rd St., plans by Kolb & Miller, 31 Union Sq., improving 1 story, 50x121 ft. plant and warehouse. $37,000 with equipment.

N. Y., New York — GARAGE — Stonedale Realty Corp., S. B. Steinmetz, pres., 251 West 98th St., plans by Moore & Landsiedel, 3rd Ave. and 148th St., constructing 2 story, garage, 446 West 29th St. $80,000.

N. Y., New York — FACTORY, etc. — Nine Hundred Thirty-Two Bway. Realty Corp., 82 Wall St. will not build factory, showroom, etc., 932 Bway. Est. about $100,000. Project indefinitely in abeyance. Noted Oct. 2, C. D.—Oct. 10, E. N.-R.

N. Y., New York—FACTORY—First Avenue and Fortieth Street Corp., 344 East 40th St., plans by J. Lubroth, 44 Court St., altering 5 story factory, 595 1st Ave. $38,000.

N. Y., New York—GARAGE, etc.—Stoneland Realty Corp., c/o Brinks Express Co., lessee, 99 Hudson St., plans 2 story, garage, and service station, 446 West 29th St. To exceed $40,000.

N. Y., New York—STORAGE, etc.—National Fire & Marine Insurance Co., 111 William St., plans by Block & Hesse, 18 East 41st St., constructing 4 story, brick, storage, lofts, showrooms, offices and apartments, 23 Cliff St. $60,000.

N. Y., Poughkeepsie—STORAGE—Effron Flour Co., 98 Montgomery St., plans 2 story storage. $75,000.

N. Y., Schenectady — FACTORY — A. Wayne Merriam, Inc., Erie Ave., plans electric appliance factory, Erie Ave. To exceed $40,000. Architect not appointed.

N. Y., Schenectady—STORAGE—United Baking Co., Syracuse, plans rebuilding storage building, Erie Blvd. To exceed $30,000. Architect not appointed.

N. Y., Syracuse—PLANT—Continental Can Co., 1 Pershing Sq., New York, plans constructing plant addition. To exceed $30,000.

N. Y., Syracuse—PLANT—Universal Building & Constr. Co., general contractors, 218 West Fayette St., steel for plant addition, West Onondaga St., to Syracuse Eng. Co., Everson Bldg., for A. W. Chapin, Inc., 375 West Onondaga St. Total est. $45,000. Noted Dec. 12, C. D.—Dec. 19, E. N.-R. under "Contracts Awarded."

N. Y., Watervliet—FACTORY—Morton C. Tuttle Co., general contractors, 31 St. James Ave., Boston, Mass., millwork for factory, for Behr Manning Corp., 10th Ave. and 27th St., to C. H. Crandall Co., 363 Saratoga St., Cohoes

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Industrial Buildings (Continued)

structural steel for Part 2, to Westside Structural Co., 19th St.Owner will purchase plumbing, heating, electrical equipment and will install with own forces, also will award separate contract for sprinkler system. Total est. $150,000. Noted Nov. 18, C.D.—Nov. 21, E.N.-R.

N. D., Minot—BREWERY—Minot Brewing Co., B. G. Renz, pres., plans brewery. To exceed $50,000.

O., Akron—MACHINE SHOP—United States Stoneware Co., 50 Church St., New York, plans new machine shop and metal fabrication building to take care of growing demand for corrosion-proof pumps, corrosion-proof fans and exhausters, etching machines, power mixing units, jar mills, etc., new clay fabricating building, new clay storage and processing dept. building; new power plant building.

O., Ashland—GRAIN ELEVATOR—J. L. Donley & Bro., P. Donley, mgr., plans rebuilding grain elevator, destroyed by fire, $28,500 or more.

O., Cincinnati—FOUNDRY, etc.—Queen City Steel Treating Co., 432 Oliver St., plans foundry, office and plant addition, on Hopple and Springrave Sts. To exceed $30,000.

O., Cincinnati—POWER PLANT—Union Gas & Electric Co., 4th and Main Sts., plans power plant, equipment and building addition on West End Stations, Columbia Eng. Corp., Cincinnati, engrs.

O., Cleveland—PLANT—Allied Printing & Binding Mchy. Co., 1975 East 65th St., plans by E. G. Hoefler, 5005 Euclid Ave., plant, $60,000. Noted Dec. 6, C. D.—Dec. 12, E. N.-R.

O., Cleveland — STORAGE, etc. — Cleveland Corrugated Box Co., 7275 Wentworth Ave., plans storage and distribution plant. $28,000 or more with equipment. Architect not appointed.

O., Cleveland—STORAGE, etc.—Sears, Roebuck & Co., South Hollman St., Chicago, Ill., plans constructing storage and distribution to replace leased premises at Neville & Wentworth Aves. and Big 4 R. R. tracks. To exceed $30,000. Architect not appointed. **Maturity indefinite.**

O., Columbus—DAIRY—The Isaly Dairy Co., 765 South 3rd St., Columbus, plans by Richards, McCarty & Bulford, 584 East Broad St., and soon takes bids 2 story dairy products plant. $150,000.

★ **O., Dayton** — POWER PLANT — Dayton Power & Light Co., 20 South Jefferson St., F. M. Tait, pres., bids about Mar. 1, 100x104 ft. power plant and equipment, installing 42,000 hp. turbo-generator, two 375,000 lb. boilers, Millers Ford Plant, turbine, to General Electric Co., 1 River Rd., Schenectady, N. Y. ***boilers, full pulverizing equipment, to Babcock & Wilcox, 85 Liberty St., New York. Est. $3,000,000. Columbia Eng. Co., Cincinnati, engrs.

O., Dover — MILL — Tuscar Metals, Inc., plans alterations and equipment for former American Sheet Tin Plate Mill. To exceed $28,000.

O., Mansfield—Westinghouse Electric & Mfg. Co. plans 4 story, brick warehouse, first unit of ½ million dollar building, $200,000. Private plans. **Maturity in spring.** Noted Nov. 21, C. D.—Nov. 28, E. N.-R.

O., Wickliffe—PLANT—Lubri-Zol Corp., St. Clair Ave., soon lets contract plant addition. $50,000.

Pa., Uniontown—PLANT—Goldberg Iron & Metal Co. plans plant, $30,000 or more. Architect not appointed.

S. D., Keystone — ORE MILL — American Rushmore Mining Co., J. W. Sharp, dir., plans (1st unit), 1,000 ton ore mill. $100,000.

Tenn., Decatur—MILL—Cherokee Knitting Mills, W. C. Campbell, pres., Cleveland, plans constructing textile mill. To exceed $40,000.

Tenn., Memphis—PLANT—Continental Can Co., 1 Pershing Sq., New York, N. Y., plans addition to plant. To exceed $40,000.

Tex., Alice—CHEESE FACTORY—Kraft-Phoenix Corp., Alice, and Waco (Texas headquarters), plans cheese and by-product factory, having 100,000 gal. milk daily capacity. $70,000. Private plans.

Tex., Houston—BAKERY—Main Baking Co., 2203 North Main St., plans by J. Finger, Natl. Standard Bldg., bakery. $50,000.

Tex., Houston — FACTORY, etc. — Houston Armature Wks., 4 Preston Ave., plans factory, shop and storage. $28,000 or more with equipment. **Maturity indefinite.** Architect not appointed.

Vt., Seaver Brook—MILL, etc.—E. R. Wiggins Co., Seaver Brook, plans mill and storage Charlestown Rd. To exceed $40,000. Architect not appointed.

Va., Culpeper—GARMENT FACTORY—Culpeper Industrial Building Corp., c/o S. & K. Knee Pants Co., lessee, Lynchburg, Va., soon lets contract constructing garment factory. To exceed $40,000.

Wash., Hoquiam—PLANT—Grays Harbor Pulp & Paper Co., W. S. Lacey, mgr., plans breakdown and clipping plant, at present plant, also dredging to be let after first of year. $50,000.

Wash., Seattle—PLANT—Continental Can Co., 1 Pershing Square, New York, plans plant addition. To exceed $40,000.

W. Va., Moundsville — DISTRIBUTION — Trimble-Johnson Hardware Co. plans distribution and storage building. To exceed $50,000. **Maturity indefinite.** Architect not appointed.

W. Va., Wheeling — COAL PLANT — Hanna Coal Co., Willow Grove, plans coal plant improvements, Willow Grove. $100,000.

Alta., Brooks — FACTORY — National Food Products Ltd., plans canning factory. $75,000.

B. C., Vancouver—GAS STATIONS—Lench Petroleum Co. Ltd., lessee, 119 Pender St. W., making plans expending $160,000 for constructing gas stations and other facilities in various locations to handle the products of Signal Oil Co. of Los Angeles. G. Young, engr. in charge of work.

Man., Winnipeg—PLANT—Dominion Odolite Products Ltd., J. A. Bradley, mgr., purchases site for manufacturing plant.

N. S., Sydney—PLANT—Dominion Tar & Chemical Co. Ltd. making plans large extension to plant.

Ontario — MINING DEVELOPMENT — May Spiers Gold Mines Ltd., c/o Otto May, 10 Springmount St., Toronto, plans gold mining development in various locations. To exceed $100,000.

Ontario—MINING DEVELOPMENT—Wendigo Gold Mines Ltd., c/o H. D. Tudor, pres., 244 Bay St., Toronto, plans gold mining development in various locations. To exceed $100,000.

Ont., Therold—POWER PLANT—See "Contracts Awarded."

★ **Que., Comeau Bay**—PAPER MILL, etc.—Ontario paper Co. Ltd., 485 McGill St., Montreal, making plans new power development and construction paper mill, below Quebec about 200 mi. $8,000,000. J. Stadler, 1117 St. Catherine St. W., Montreal, consult. engr.

Que., Montreal—PLANT—National Drug & Chemical Co. Ltd., purchased site on Lagauchitiere St., and plans plant.

Que., Quebec City — WAREHOUSE — LaCompagnie Lachance, 263 St. Paul St. making plans constructing warehouse on St. Valier St. $45,000.

Que., St. Pie de Bagot—TANNERY—Guilbert Pur Co. Ltd. plans rebuilding 3 story tannery, $50,000 loss.

Sask., Kindersley—REFINERY—Goose Lake Oil Refining Co. Ltd., making plans refinery. $50,000.

Sask., Retlaw—GRAIN ELEVATOR—Ogilvie Milling Co. Ltd., making plans grain elevator. $40,000.

BIDS ASKED

W. Va., Granville—PLANT—See "Contracts Awarded."

CONTRACTS AWARDED

Calif., Los Angeles—FACTORY—Ford Motor Co., East 7th St. and Santa Fe Ave., altering factory, East 7th St. and Santa Fe Ave., to C. L. Peck, 354 South Spring St., $65,000. Est. $50,000. Parkinson & Parkinson, 808 Title Insurance Bldg., Los Angeles, archts.

Calif., Santa Barbara—CITRUS PLANT—Goleta Citrus Growers Assn., 10 mi. north of Santa Barbara, 1 and part 2 story, 120x300 ft., T-shaped, citrus plant, timber, near here, to C. Jones, Upland, approximately $70,000. Noted Oct. 25, C. D.—Oct. 31, E. N.-R.

Ga., Waycross—PLANT—Rubin Bros., constructing 1 and 2 story, basement, rein.-con., brick, steel manufacturing plant, to Dan Morgan, Waycross, $53,770. Private plans.

Ill., Bloomington—FACTORY—Paul Beich Co., Bloomington, constructing factory addition, separate contracts awarded. To exceed $28,000.

Ill., Chicago—BREWERY—Monk Brewery Co., 4513 Armitage Ave., constructing brewery addition, to Stubenwoll Concrete & Constr. Co., 4833 Montana Ave. Est. $40,000.

Mass., Lynn — POWER PLANT — Stone & Webster Eng. Corp., engrs. and general contractors, 49 Federal St. Boston, forced draft and indirect draft fans in connection with boiler house construction, Broad St., for Lynn Gas & Electric Co., 90 Exchange St., to B. F. Sturtevant Co., 89 Broad St., Boston; coal pulverizers and coal burners, to Riley Stoker Corp., 27 State St., Boston. Noted Oct. 29, C. D.—Oct. 31, E. N.-R.

Mass., Roxbury—BUS STORAGE GARAGE—Boston Elevated Railway, 31 St. James Ave., Boston, 1 story, brick, steel bus storage garage, concrete found., Washington St., to J. W. Bishop Co., 100 Erie St., Cambridge. To exceed $40,000. Private plans. Bids Dec. 10 awarded Dec. 16.

Minn., Jordan—BREWERY—Schultz & Hilgers Brewery, constructing brewery addition, to Schmidt Bros., Belle Blaine, $40,000. Noted June 4, C. D.—June 7, E. N.-R.

N. J., Maurer—PLANT and STORAGE—Barber Asphalt Co., tanks containing about 1,000 tons of steel, for bulk plant and storage, to Chicago Bridge & Iron Wks., 165 Broadway, New York. Total est. exceeds $100,000.

N. Y., Buffalo—PLANT—Molin Corp., Crosby Bldg., plumbing for plant addition, Eagle St., to Kirkpatrick & Haller, 20 West Utica St.*** heating, to Quackenbush & Co., 579 Michigan Ave.***electrical work, to Robertson Electric Co., 126 South Elmwood Ave. Noted Dec. 23, C. D.—Dec. 26, E. N.-R., under "Contracts Awarded."

N. Y., New York—BUS TERMINAL—Capitol Bus Terminal Corp., c/o T. W. Lamb, archt., 701 7th Ave., New York, demolition of buildings on site of bus terminal, 235 West 50th St., to A. A. Volk Co., 1819 Bway. To exceed $100,000. Bids soon on superstructure.

N. Y., New York—STORAGE, etc.—Trinity Church Corp., 74 Trinity Pl., altering 9 story storage and distribution, 326 Hudson St. to Wilton Constr. Co., 326 Hudson St., New York. To exceed $35,000. Masback Hardware Co., 74 Warren St., lessee.

N. Y., Syracuse—PLANT—Universal Building & Constr. Co., general contractors, 218 West Fayette St., heating for plant addition, Onondaga St., for A. W. Chapin, Inc., 375 West Onondaga St., to D. C. Group, 240 Erie Blvd. E.***electrical work, to L. W. Kieswetter, 602 North Salina St. ***sprinkler system, to Sprinkler Co., 1042 University Ave., Rochester. Noted Dec. 12, C. D.—Dec. 19, E. N.-R., under "Contracts Awarded."

O., Canton — PLANT ADDITION — Hercules Motor Corp., 11th St. S.E., general contract 1 story, basement, 100x175 ft., brick, steel, concrete plant addition for office building, to L. W. Kilgore Co., 351 21st St. N.W., Canton, $40,000. Est. $40,000. Noted Nov. 18, C. D.—Nov. 21, E. N.-R.

O., Cincinnati—FACTORY—Queen City Steel Treating Co., 432 Oliver St., 2 story, basement, 120x162 ft. brick factory, to Meyer-Hecht Co., 2824 Stanton St. Awarded Dec. 24.

Okla., El Reno—MILL—Canadian Mill Co., El Reno, 6 story, basement, 36x100 ft., brick, steel mill building, to Jones-Hettelsater Co., Mutual Bldg., Kansas City, Mo., $75,000. Homer & Wyatt, Kansas City, Mo., engrs.

Ore., Portland—COLD STORAGE PLANT—Oregon Washington Railway & Navigation Co., Pittock Bldg., constructing cold storage plant, to G. H. Buckler Co., Lewis Bldg., Est. $150,000. Pacific Fruit & Produce Co., 203 Southeast Alder St., lessee.

Pa., Palmerton—FACTORY—New Jersey Zinc Co., 250 tons structural steel for new factory addition, to Lehigh Structural Steel Co., Allentown. Noted Oct. 14 C. D.—Oct. 17, E. N.-R.

Pa., Pittsburgh—WAREHOUSE—Baltimore & Ohio R. R., Smithfield and Water Sts., constructing 80 x 226 ft. banana warehouse, 21st and Railroad Sts., to Rust Eng. Co., Clark Bldg. Est. $100,000.

★ **Tenn., Chattanooga**—PLANT—U. S. Pipe & Fdry. Co., West 27th St., plant improvements, to United Engineers & Constructors, 42 Bway., New York (engineers and contractors). United Engineers and Constructors, 42 Bway., New York, awarding separate contracts for owner, 1,200 tons structural steel, to Converse Bridge & Steel Co., 2408 Vance Ave., Chattanooga. Total est. $600,000.

Tenn., Johnson City — PLANT — Pet Dairy Products Co. plant, all separate contracts awarded. Est. $50,000.

Tenn., Memphis — WAREHOUSE — Capt. Robert E. Lee, Empire Bldg., constructing 328x349 ft. warehouse, Webster Ave. near South 3rd St., to S. Malkin Constr. Co., 685 North Parkway. Est. $100,000. Wheeling Steel Corp., 285 West Trigg Ave., lessee. Awarded in December.

W. Va., Granville—PLANT—American Oil Co., American Bldg., Baltimore, constructing distribution plant left bank of Monongahela River, near here, incl. concrete dolphins, 6 in. pipe line, day labor and separate contracts $28,500 or more. Noted Dec. 11, C. D.—Dec 19, E. N.-R.

Wis., Appleton—LABORATORY—Institute of Paper Chemistry, general contract 2 story, basement, 40x115 ft. and 42x35 ft. laboratory addition, to B. B. Ganther Co., Oshkosh*** lamson stone, to Lammon Quarries Corp., Beaver***structural steel, to Vulcan Mfg. Co., Fond du Lac***reinforcing steel, to Kalman Steel Co., 212 West Wisconsin Ave., Milwaukee ***mason material, to H. Schabo & Sons, Appleton***Haydite roofing, to Federal American Cement Tile Co., Chicago, Ill.***steel sash, to Federal Steel Co., Waukesha. Orbison & Orbison, Appleton, archts.

Wis., Milwaukee — BREWERY — J. Schlitz Brewing Co., 235 West Gelena St., general contract superstructure for "E" storage building, 6 story, 87x101 ft., to Meredith Bros. Co., 121 East Washington St. Noted Dec. 12, C. D.—Dec. 19, E. N.-R.

★ **Ont., Therold**—POWER PLANT—Ontario Paper Co., Allanburg Rd., 2 boilers, furnaces, economizers, super-heaters, preheaters for 1 story, basement, 62x155 ft. power plant, Allanburg Rd., to Foster-Wheeler Ltd., 81 Westchester Ave., St. Catherine; building proper, by own forces. Bids about Jan. 27, for electrical equipment incl. turbo-generators. Est. $1,100,000. Private plans. Noted Oct. 4, C. D.—Oct. 11, E. N.-R.

Que., Quebec City—WAREHOUSE—Mathieu & Sylvain, general contractors, 40 St. Ursule St., painting warehouse, to Marier Tremblay, 42 DuPont St.

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For official proposal advertising see Searchlight Section

†*Federal Government.*